TOOELE
ARMY
DEPOT

FINAL

DECISION DOCUMENT
GROUP A SUSPECTED RELEASES SWMUs
TOOELE ARMY DEPOT
TOOELE, UTAH

ContractNo.DACA31-94-D-0060
DeliveryOrderNo.1

Preparedfor:

TOOELEARMYDEPOT
Tooele,Utah

Preparedby:

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April 2001

Tooele Army Depot

April 2001

Final Decision Document

for Group A Solid Waste Management Units 1b, 1c, 20, 21, 34, 37, 42, 45, and 48

The Decision Document

After completion of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and Corrective Measures Study (CMS) for the Group A Solid Waste Management Units (SWMUs), the Tooele Army Depot (TEAD) has identified preferred corrective measures alternatives for soil contamination. The following corrective measures are put forth as initial recommendations only, not as final decisions, for public comment:

? SWMU 1b (Burn Pad):	Land use restrictions to prevent residential use of the site ($12,000)
? SWMU 1C (Trash Burn Pits):	Land use restrictions to prevent residential use of the site ($12,000)
? SWMU 20 (AED Deactivation Furnace Site):	Asphalt cover and land use restrictions to prevent residential use of the site ($130,000)
? SWMU 21 (Deactivation Furnace Building):	Asphalt cover and land use restrictions to prevent residential use of the site ($230,000)
? SWMU 34 (Pesticide Handling and Storage Area):	Excavation, off-post treatment/disposal, and land use restrictions to prevent residential use of the site ($63,000)
? SWMU 37 (Contaminated Waste Processing Plant):	Land use restrictions to prevent residential use of the site ($12,000)
? SWMU 42 (Bomb Washout Building):	Soil cover, fence, and land use restrictions to prevent residential use of the site ($520,000)
? SWMU 45 (Stormwater Discharge Area):	Land use restrictions to prevent residential use of the site ($12,000)
? SWMU 48 (Old Dispensary Discharge-Building 400):	Land use restrictions to prevent residential use of the site ($12,000)

Figure 2, page 5, of this Decision Document shows the location of each Group A SWMU addressed herein.

These proposed corrective measures will significantly reduce risk to human health and the environment.

A public meeting will be held to discuss this *Decision Document* for the Group A SWMUs on:

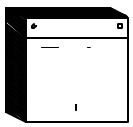
_____, 2001

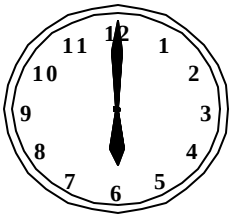
Tooele County Courthouse, Tooele, Utah

Poster Session _____ PM

Informational Meeting _____ PM

For additional information on the meeting, call Environmental Management Division, Tooele Army Depot, at (435) 833-3504.





The Community's Role in the Selection Process

How to Submit a Formal Comment

The Army solicits input from the community on the actions proposed in this Decision Document. A comment period from _____ to _____, is established to encourage public participation in this process. At the public meeting, the Army will present the results of the RFI, the CMS, and the Decision Document; answer questions; and accept both oral and written comments. Representatives of EPA and the State of Utah will be present to answer questions.

During the public comment period, you may submit a formal comment in any of the following ways:

1. Mail written comments to:

   Tooele Army Depot
   Attn: SDSTE-IRE/Larry McFarland
   Environmental Management Division
   Building T8
   Tooele, UT 84074-5000

2. Fax written comments to: (435) 833-2839.

3. Offer verbal comments during the public hearing to be held on _____.

Please note that there is a distinction between formal comments received during the public comment period and informal comments received outside of the comment period. Although TEAD will respond to all comments regardless of when they are received, only the formal comments postmarked by _____, and TEAD's responses to those comments will be addressed in the responsiveness summary.

TEAD will consider all formal comments received during the public comment period prior to making the final decision for each site. Formal comments become part of the official public record.

All formal comments and TEAD's written responses will accompany the Final Decision Document for the Group A SWMUs. Copies of the responses will be mailed to anyone who submits a formal comment. In addition, TEAD will announce the decision through the local news media and the mailing list. (A form for requesting addition of your name to the mailing list is included as page 51 of this document).

Upon timely request, the comment period may be extended for 30 days. Such a request should be submitted in writing to TEAD. The request must be received no later than _____.

For More Information

The Decision Document for the Group A SWMUs highlights information that can be found in greater detail in the RFI Report, the CMS Report, and other available reports. These reports are contained in the TEAD Administrative Record.

The Decision Document will be added to the Administrative Record upon completion. The Army encourages the public to review and comment on these supporting documents, which are available at the following locations:

Tooele Army Depot
Public Affairs Office
T-1 Headquarters Building
Tooele Army Depot, UT 84074

Tooele Public Library
47 East Vine Street
Tooele, UT 84112

Marriott Library
University of Utah
372 S. Marriott
Salt Lake City, UT 84112

BURN PAD (SWMU 1b)

The Burn Pad consisted of a 300- by 100-foot cleared pad where propellant was burned in open trenches and projectiles were flashed. Site activities began prior to 1959 and reportedly were discontinued before 1977.

Test pits were excavated and soil samples were collected to determine whether contamination exists due to previous activities. No contaminants of concern were detected.

Based on the sampling conducted at SWMU 1b, there are no elevated cancer risks or hazards for the military or construction worker at the site. However, elevated risks and hazards were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 1b poses a low ecological risk.

The reasonably anticipated future land use of SWMU 1b is military. An evaluation of management measures is required to protect against future residential use.

Comparative Analysis of Alternatives
Burn Pad (SWMU 1b)

Evaluation Criterion (a)		Land Use Restrictions
Technical	Performance	High
	Reliability	High
	Implementability	High
	Safety	High
Human health assessment		High
Environmental assessment		High
Administrative feasibility		High
Cost		$12,000
Relevant section in Corrective Measures Study		3.2

(a) Rankings indicate the effectiveness of this alternative in meeting the evaluation criteria.

Recommended Corrective Measures Alternative for Burn Pad (SWMU 1b)

Alternative 1:

Land use restrictions are the recommended corrective measures for the Burn Pad.

For more information about SWMU 1b, see pages 16 to 17, and Table 1 on page 42, in this Decision Document.

TRASH BURN PITS (SWMU 1c)

The Trash Burn Pits consisted of disposal pits reportedly several hundred feet long, 8- to 10-feet wide, and 4- to 6-feet deep. Disposal and waste burning activities occurred at SWMU 1c from approximately 1959 to the 1980s.

Test pits were excavated and soil samples were collected to determine whether contamination exists due to previous activities. Elevated levels of lead, beryllium, and RDX (an explosive) were detected in isolated soil samples.

Based on the sampling conducted at SWMU 1c, there are no elevated cancer risks or hazards for the military or construction worker at the site. However, elevated risks and hazards were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 1c poses a low ecological risk.

The reasonably anticipated future land use of SWMU 1c is military. An evaluation of management measures is required to protect against future residential use.

Comparative Analysis of Alternatives
Trash Burn Pits (SWMU 1c)

Evaluation Criterion (a)		Land Use Restrictions
Technical	Performance	High
	Reliability	High
	Implementability	High
	Safety	High
Human health assessment		High
Environmental assessment		High
Administrative feasibility		High
Cost		$12,000
Relevant section in Corrective Measures Study		4.2

(a) Rankings indicate the effectiveness of this alternative in meeting the evaluation criteria.

Recommended Corrective Measures Alternative for Trash Burn Pits (SWMU 1c)

Alternative 1:

Land use restrictions are the recommended corrective measures for the Trash Burn Pits.

For more information about SWMU 1c, see pages 18 to 19, and Table 1 on page 42, in this Decision Document.

AED DEACTIVATION FURNACE SITE (SWMU 20)

SWMU 20 – a large asphalt pad – includes Building 1351, where munitions were destroyed in a deactivation furnace; the building also contains a flashing furnace and a large air pollution control system. Building 1352 is a small storage building. SWMU 20 is currently used to conduct treatability studies and operates under interim RCRA approval through an experimental variance.

Soil samples were collected to determine whether contamination exists due to previous activities. Elevated levels of antimony and lead were detected.

Based on the sampling conducted at SWMU 20, there are no elevated cancer risks or hazards for the military or construction worker at the site. However, elevated risks, hazards, and blood lead levels were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 20 poses a moderate ecological risk.

The reasonably anticipated future land use of SWMU 20 is military. Several locations along the northern edges of the asphalt pad require corrective action. The estimated volume of contaminated soil is 270 cubic yards.

Comparative Analysis of Alternatives
AED Deactivation Furnace Site (SWMU 20)

Evaluation Criterion (a)		Alt. 1: Land Use Restrictions	Alt. 2: Asphalt Cover and Land Use Restrictions	Alt. 3: Excavation, Solidification/ Stabilization, and Land Use Restrictions	Alt. 4: Excavation, Soil Washing, and Land Use Restrictions	Alt. 5: Excavation, Off-Post Treatment/Disposal, and Land Use Restrictions
Technical	Performance	Low	Moderate	Moderate	Moderate	High
	Reliability	Moderate	Moderate	Moderate	Moderate	High
	Implementability	High	High	Moderate	Moderate	High
	Safety	High	High	Moderate	Moderate	Moderate
Human health assessment		Low	High	High	High	High
Environmental assessment		Moderate	High	High	High	High
Administrative feasibility		Low	High	Moderate	Moderate	Moderate
Cost		$12,000	$130,000	$270,000	$280,000	$200,000
Relevant section in Corrective Measures Study		5.2.1	5.2.2	5.2.3	5.2.4	5.2.5

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.

Recommended Corrective Measures Alternative for AED Deactivation Furnace Site (SWMU 20)

Alternative 2:

Asphalt cover and land use restrictions are the recommended corrective measures for the AED Deactivation Furnace Site.

For more information about SWMU 20, see pages 20 to 23, and Table 1 on page 42, in this Decision Document.

DEACTIVATION FURNACE BUILDING (SWMU 21)

SWMU 21 is an ammunition demilitarization production facility constructed about 1955. It currently operates under a RCRA Part B permit. Building 1320 contains a rotary-kiln furnace that is used to deactivate small arms ammunition, primers, and fuses. Current operations do not add to the previous contamination.

Soil samples were collected to determine whether contamination exists due to site operations. Elevated levels of metals were identified in the surface soil surrounding Building 1320.

Based on the sampling conducted at SWMU 21, there are no elevated cancer risks for the military or construction worker at the site; however, hazards and blood lead levels are unacceptable. Elevated risks, hazards, and blood lead levels were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 21 poses a potentially unacceptable ecological risk.

The reasonably anticipated future land use of SWMU 21 is military. The unpaved area surrounding Building 1320 requires corrective action. The estimated volume of contaminated soil is 850 cubic yards.

Comparative Analysis of Alternatives
Deactivation Furnace Building (SWMU 21)

Evaluation Criterion (a)		Alt. 1: Asphalt Cover and Land Use Restrictions	Alt. 2: Excavation, Solidification/ Stabilization, and Land Use Restrictions	Alt. 3: Excavation, Soil Washing, and Land Use Restrictions	Alt. 4: Excavation, Off-Post Treatment/ Disposal, and Land Use Restrictions
Technical	Performance	Moderate	Moderate	Moderate	High
	Reliability	Moderate	Moderate	Moderate	High
	Implementability	High	Moderate	Moderate	High
	Safety	High	Moderate	Moderate	Moderate
Human health assessment		High	High	High	High
Environmental assessment		High	High	Moderate	High
Administrative feasibility		High	Moderate	Moderate	Moderate
Cost		$230,000	$480,000	$550,000	$560,000
Relevant section in Corrective Measures Study		6.2.1	6.2.2	6.2.3	6.2.4

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.

Recommended Corrective Measures Alternative for Deactivation Furnace Building (SWMU 21)

Alternative 1:

Asphalt cover and land use restrictions are the recommended corrective measures for the Deactivation Furnace Building.

For more information about SWMU 21, see pages 24 to 27, and Table 1 on page 42, in this Decision Document.

PESTICIDE HANDLING AND STORAGE AREA (SWMU 34)

SWMU 34 consists of Building 518 and a bermed concrete pad. The building was used from 1942 until recently for storing pesticides and herbicides, preparing application mixtures, loading sprayer trucks, and rinsing containers. Some activities still occur at this SWMU.

Soil samples were collected to determine whether contamination exists due to previous activities. Elevated levels of pesticides were identified in isolated soil samples.

Based on the sampling conducted at SWMU 34, there are no elevated cancer risks or hazards for the military or construction worker at the site. However, elevated risks and hazards were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 34 poses a low ecological risk.

The reasonably anticipated future land use of SWMU 34 is military. Several small areas within the site require corrective action. The estimated volume of contaminated soil is 31 cubic yards.

Comparative Analysis of Alternatives
Pesticide Handling and Storage Area (SWMU 34)

Evaluation Criterion (a)		Alt. 1: Land Use Restrictions	Alt. 2: Soil Cover, Fence, and Land Use Restrictions	Alt. 3: Excavation, Off-Post Treatment/Disposal, and Land Use Restrictions
Technical	Performance	Moderate	Moderate	High
	Reliability	Moderate	Moderate	High
	Implementability	High	High	High
	Safety	High	High	Moderate
Human health assessment		Moderate	High	High
Environmental assessment		Moderate	High	High
Administrative feasibility		Moderate	High	High
Cost		$12,000	$43,000	$63,000
Relevant section in Corrective Measures Study		7.2.1	7.2.2	7.2.3

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.

Recommended Corrective Measures Alternative for Pesticide Handling and Storage Area (SWMU 34)

Alternative 3:

Excavation, off-post treatment/disposal, and land use restrictions are the recommended corrective measures for the Pesticide Handling and Storage Area.

For more information about SWMU 34, see pages 28 to 30, and Table 1 on page 42, in this Decision Document.

CONTAMINATED WASTE PROCESSING PLANT (SWMU 37)

SWMU 37 includes Building 1325A, along with a smaller storage building and paved staging and storage areas. From approximately 1980 until it was closed in 1990, the contaminated waste processor in Building 1325A was used for flashing scrap metal and incinerating PCP-treated wooden crates, general packaging materials, scrap resins, and fabric contaminated with explosives. It was not used for deactivating munitions.

Soil samples were collected to determine whether contamination exists due to previous activities. Benzo(a)anthracene, benzo(a)pyrene, and dioxins/furans were identified at elevated levels in isolated soil samples.

Based on the sampling conducted at SWMU 37, there are no elevated cancer risks or hazards for the military or construction worker at the site. However, elevated risks and hazards were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 37 poses a moderate ecological risk.

The reasonably anticipated future land use of SWMU 37 is military. An evaluation of management measures is required to protect against future residential use.

Comparative Analysis of Alternatives
Contaminated Waste Processing Plant (SWMU 37)

Evaluation Criterion (a)		Land Use Restrictions
Technical	Performance	High
	Reliability	High
	Implementability	High
	Safety	High
Human health assessment		High
Environmental assessment		High
Administrative feasibility		High
Cost		$12,000
Relevant section in Corrective Measures Study		8.2

(a) Rankings indicate the effectiveness of this alternative in meeting the evaluation criteria.

Recommended Corrective Measures Alternative for Contaminated Waste Processing Plant (SWMU 37)

Alternative 1:

Land use restrictions are the recommended corrective measures for the Contaminated Waste Processing Plant.

For more information about SWMU 37, see pages 31 to 32, and Table 1 on page 42, in this Decision Document.

BOMB WASHOUT BUILDING (SWMU 42)

SWMU 42 includes four furnaces that operated from the 1940s to the 1960s. Building 539 contained a demilitarization furnace for small arms munitions. Washwater from this building was discharged to a ditch that extends to a former unlined holding pond. A second unenclosed furnace was used to incinerate fuses and small munitions. In addition, two deactivation furnaces were used for popping primers and melting lead for recycling.

A geophysical investigation was conducted and soil samples were collected to determine whether contamination exists due to previous activities. Elevated levels of metals, 2,4-DNT, and dioxins/furans were identified in soil.

Based on the sampling conducted at SWMU 42, there are no elevated cancer risks for the military or construction worker at the site; however, hazards and blood lead levels are unacceptable. Elevated risks, hazards, and blood lead levels were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 42 poses a potentially unacceptable ecological risk.

The reasonably anticipated future land use of SWMU 42 is military. The drainage ditch, former holding pond, and several isolated small areas require corrective action. The estimated volume of contaminated soil is 3,530 cubic yards.

Comparative Analysis of Alternatives
Bomb Washout Building (SWMU 42)

Evaluation Criterion (a)		Alt. 1: Soil Cover, Fence, and Land Use Restrictions	Alt. 2: Excavation, Solidification/ Stabilization, and Land Use Restrictions	Alt. 3: Excavation, Soil Washing, and Land Use Restrictions	Alt. 4: Excavation, Off-Post Treatment/ Disposal, and Land Use Restrictions
Technical	Performance	Moderate	Moderate	Moderate	High
	Reliability	Moderate	Moderate	Moderate	High
	Implementability	High	Moderate	Moderate	High
	Safety	Moderate	Moderate	Low	Low
Human health assessment		High	High	High	High
Environmental assessment		High	High	Moderate	High
Administrative feasibility		High	Moderate	Moderate	High
Cost		$520,000	$1,280,000	$1,630,000	$2,120,000
Relevant section in Corrective Measures Study		9.2.1	9.2.2	9.2.3	9.2.4

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.

Recommended Corrective Measures Alternative for Bomb Washout Building (SWMU 42)

Alternative 1:

Soil cover, fence, and land use restrictions are the recommended corrective measures for the Bomb Washout Building.

For more information about SWMU 42, see pages 33 to 36, and Table 1 on page 42, in this Decision Document.

STORMWATER DISCHARGE AREA (SWMU 45)

SWMU 45 includes an unlined earthen basin and associated pipelines from the Administration Area's stormwater collection system. Stormwater has been discharged to SWMU 45 since 1942.

Soil, sediment, surface water, and groundwater samples were collected to determine whether contamination exists due to previous activities. No contaminants of concern were detected in these samples.

Based on the sampling conducted at SWMU 45, there are no elevated cancer risks or hazards for the military or construction worker at the site. However, elevated risks, hazards, and blood lead levels were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 45 poses a moderate ecological risk.

The reasonably anticipated future land use of SWMU 45 is military. An evaluation of management measures is required to protect against future residential use.

Comparative Analysis of Alternatives
Stormwater Discharge Area (SWMU 45)

Evaluation Criterion (a)		Land Use Restrictions
Technical	Performance	High
	Reliability	High
	Implementability	High
	Safety	High
Human health assessment		High
Environmental assessment		High
Administrative feasibility		High
Cost		$12,000
Relevant section in Corrective Measures Study		10.2

(a) Rankings indicate the effectiveness of this alternative in meeting the evaluation criteria, relative to other alternatives.

Recommended Corrective Measures Alternative for Stormwater Discharge Area (SWMU 45)

Alternative 1:

Land use restrictions are the recommended corrective measures for the Stormwater Discharge Area.

For more information about SWMU 45, see pages 37 to 38, and Table 1 on page 42, in this Decision Document.

OLD DISPENSARY DISCHARGE – BUILDING 400 (SWMU 48)

SWMU 48 includes the site of the former TEAD Dispensary (Building 400) and nine smaller buildings. The dispensary served as a hospital for TEAD, and the development of x-rays may have generated contaminated waste.

Soil samples were collected to determine whether contamination exists due to previous activities. No contaminants of concern were detected in these samples.

Based on the sampling conducted at SWMU 48, there are no elevated cancer risks or hazards for the military or construction worker at the site. However, elevated risks and hazards were identified for the hypothetical future onsite resident.

The sitewide ecological assessment determined that SWMU 48 poses a low ecological risk.

The reasonably anticipated future land use of SWMU 48 is military. An evaluation of management measures is required to protect against future residential use,.

Comparative Analysis of Alternatives
Old Dispensary Discharge – Building 400
(SWMU 48)

Evaluation Criterion (a)		Land Use Restrictions
Technical	Performance	High
	Reliability	High
	Implementability	High
	Safety	High
Human health assessment		High
Environmental assessment		High
Administrative feasibility		High
Cost		$12,000
Relevant section in Corrective Measures Study		11.2

(a) Rankings indicate the effectiveness of this alternative in meeting the evaluation criteria.

Recommended Corrective Measures Alternative for Old Dispensary Discharge – Building 400 (SWMU 48)

Alternative 1:

Land use restrictions are the recommended corrective measures for the Old Dispensary Discharge – Building 400.

For more information about SWMU 48, see pages 39 to 40, and Table 1 on page 42, in this Decision Document.

CONTENTS

CONTENTS (cont'd)

INTRODUCTION*

This ***Decision Document*** briefly discusses the preferred ***corrective measures*** and supporting analyses for nine ***solid waste management units (SWMUs)*** at Tooele Army Depot (TEAD), Tooele, Utah. The nine Group A Suspected Releases SWMUs are listed below:

- SWMU 1b (Burn Pad)
- SWMU 1c (Trash Burn Pits)
- SWMU 20 (Ammunition Engineering Directorate (AED) Deactivation Furnace Site)
- SWMU 21 (Deactivation Furnace Building)
- SWMU 34 (Pesticide Handling and Storage Area)
- SWMU 37 (Contaminated Waste Processing Plant)
- SWMU 42 (Bomb Washout Building)
- SWMU 45 (Stormwater Discharge Area)
- SWMU 48 (Old Dispensary Discharge – Building 400)

This document is issued by the U.S. Army (the owner of TEAD), the U.S. Environmental Protection Agency (EPA), and the Utah Department of Environmental Quality (UDEQ; the State regulatory support agency for TEAD) as part of their public participation responsibilities under the ***Resource Conservation and Recovery Act (RCRA)***.

Following the review of information received during the public comment period, the Army and UDEQ will select a final corrective measure for each of the nine SWMUs addressed herein. The Response to Comments and Final Decision Document and the ***RCRA Post Closure Monitoring and Corrective Action Permit*** (CAP) modification will present the selected corrective measures.

The Decision Document highlights information that can be found in greater detail in the Phase I ***RCRA Facility Investigation (RFI)*** Report, the ***Corrective Measures Study (CMS)*** Work Plan, the CMS Report, and other available reports. The Army encourages the public to review and comment on these supporting documents, which are available at the following locations:

Tooele Army Depot
Public Affairs Office
T-1 Headquarters Building
Tooele Army Depot, UT 84074

Tooele Public Library
47 East Vine Street
Tooele, UT 84074

Marriott Library
University of Utah
372 S. Marriott
Salt Lake City, UT 84112

*Terms shown in bold italics are defined in the Word Notebook, pages 45 to 47.

PROGRAM SUMMARY

The program summary reviews historical information on TEAD and presents an overview of the RFI (including the human health and ecological ***risk assessments*** (RAs)) and the CMS.

FACILITY BACKGROUND

TEAD is located in Tooele Valley, Tooele County, Utah, immediately west of the City of Tooele (population 13,887 in 1990) and approximately 35 miles southwest of Salt Lake City. The installation covers 23,473 acres; 1,700 acres (from an original 25,173) were transferred in December 1998 under the ***Base Realignment and Closure*** (BRAC) program. The surrounding area is largely undeveloped, with the exception of Tooele, Grantsville (population 4,500, north of TEAD), and Stockton (population 400, south of TEAD).

Land use surrounding the Depot includes pasture, cultivation, and rangeland grazing. Figure 1 shows the location of TEAD.

TEAD was originally established as the Tooele Ordnance Depot in 1942. It was renamed the Tooele Army Depot - North Area (TEAD-N) in 1962 and given its present designation ("TEAD") in June 1996. TEAD was used for the maintenance and repair of Army vehicles and equipment; the storage, maintenance, and disposal of munitions; and the support of other Army installations in the western United States.

The mission of maintaining and repairing vehicles and equipment was discontinued in 1995. The remaining two missions are expected to continue for the foreseeable future. A portion of TEAD, including the Administration Area and Maintenance Area, was transferred as part of the BRAC program. This parcel will be converted from military to nonmilitary use. None of the Group A SWMUs are located within the BRAC parcel.

As a result of past operations at TEAD, a variety of known or suspected waste and spill sites have been identified. Environmental investigations from the late 1970s to the present have identified 57 locations referred to as SWMUs.

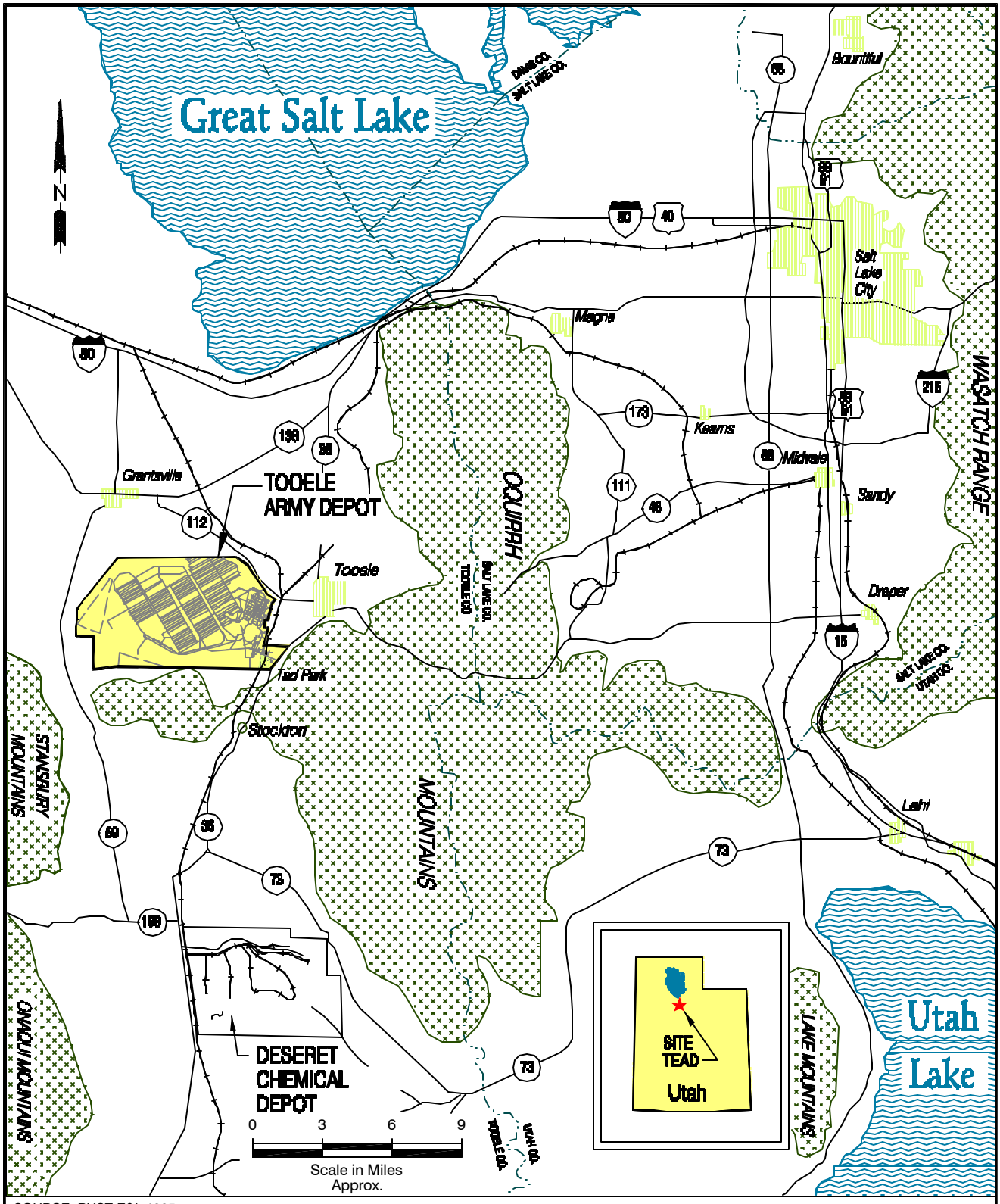
In October 1990, TEAD was placed on the ***National Priority List*** (NPL) under the ***Comprehensive Environmental Response, Compensation, and Liability Act*** (CERCLA). A ***Federal Facility Agreement*** (FFA) between the Army, EPA Region 8, and UDEQ designated 17 of the 57 SWMUs to be investigated under CERCLA. The remaining SWMUs were to be investigated under RCRA.

In January 1991, TEAD was issued a ***RCRA post-closure permit*** for the Industrial Waste Lagoon (IWL***)***, SWMU 2. The permit included a ***corrective action permit*** (CAP) that required investigation and potential cleanup at 29 SWMUs. Currently, 40 SWMUs are being addressed under the CAP. The nine Group A SWMUs discussed in this Decision Document are managed under the RCRA CAP program.

Figure 2 shows the locations of SWMUs 1b, 1c, 20, 21, 34, 37, 42, 45, and 48 within TEAD.

Descriptions of each SWMU are provided on pages 16 through 40.

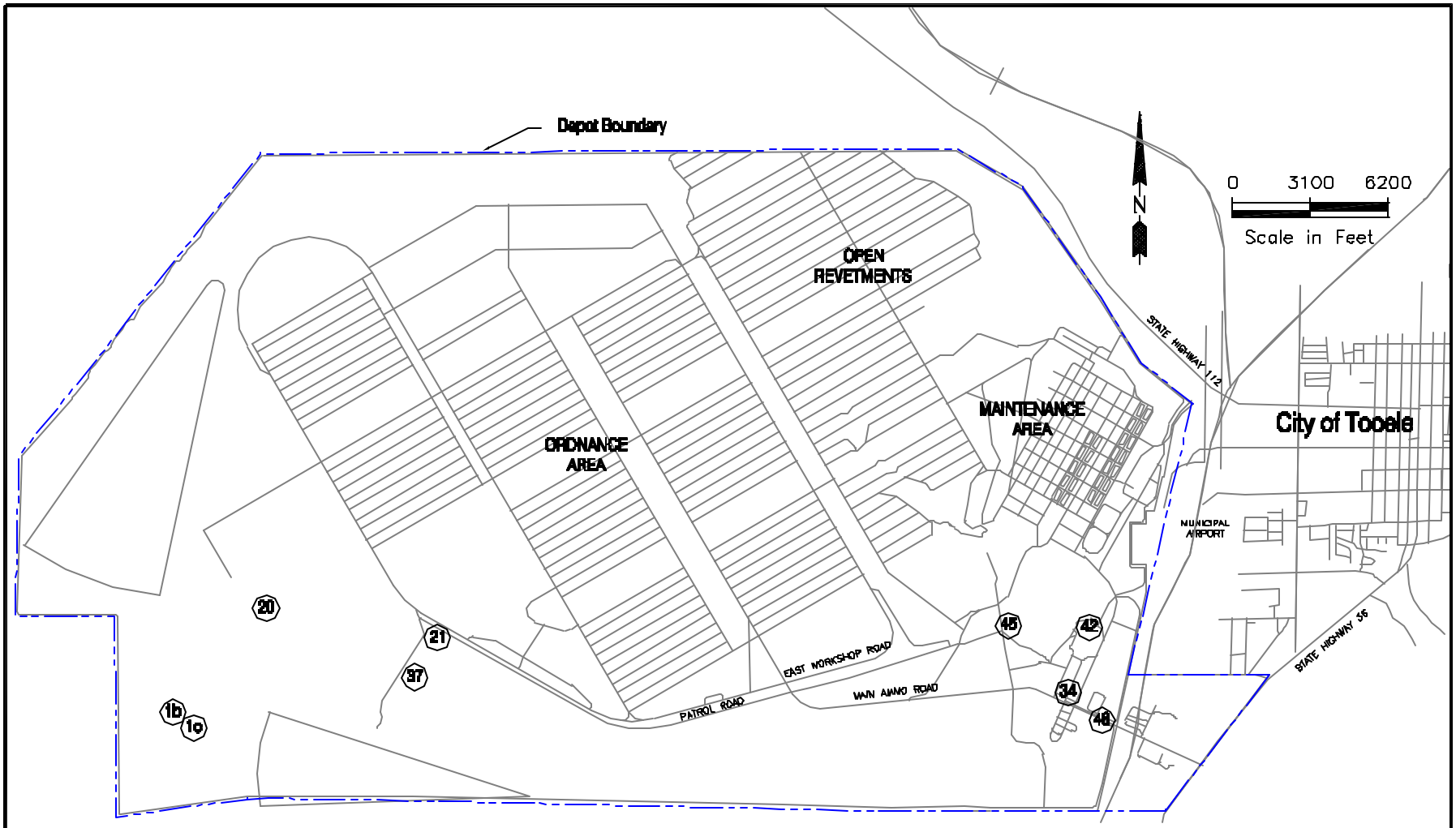
The following sections present an overview of the RFI (including the human health, and ecological RAs) and the CMS.



SOURCE: RUST E&I, 1995

FIGURE 1
LOCATION MAP OF
TOOELE ARMY DEPOT
AND VICINITY

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY



LEGEND

- 1b BURN PAD
- 1c TRASH BURN PITS
- 20 AED DEACTIVATION FURNACE SITE
- 21 DEACTIVATION FURNACE BUILDING
- 34 PESTICIDE HANDLING AND STORAGE AREA
- 37 CONTAMINATED WASTE PROCESSING PLANT
- 42 BOMB WASHOUT BUILDING
- 45 STORMWATER DISCHARGE AREA
- 48 OLD DISPENSARY DISCHARGE—BUILDING 400

SOURCE: RMS CORPORATION OCTOBER, 1988

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

FIGURE 2
LOCATION OF GROUP A
SUSPECTED RELEASES SWMUs
TOOELE ARMY DEPOT

RCRA FACILITY INVESTIGATION

Investigations were conducted at each Group A SWMU addressed in this Decision Document to evaluate the presence and extent of chemicals potentially released to the environment from past site activities. These investigations included the following:

- Collection and laboratory analysis of soil samples to assess SWMU-related contaminant concentrations.

- Comparison of these concentrations to EPA guidelines to evaluate whether they are of potential concern to human health or the environment.

- Comparison of the metals concentrations detected in site samples to ***background*** metals concentrations. (Metals are naturally occurring in soil.)

The RFI identified ***contaminants of potential concern*** (COPCs), which are those contaminants:

- Detected at levels above those found naturally in the environment.

  – or –

- Detected at levels above EPA guidelines.

The RA evaluated potential human health and ecological effects due to each of the COPCs.

Groundwater monitoring data was not collected at any of the Group A SWMUs. The depth to groundwater is greater than 600 feet bgs at SWMUs 1b, 1c, and 20, and greater than 350 feet bgs at the other Group A SWMUs. Contaminant concentrations decrease to low levels in the shallow subsurface soil at each SWMU. Based on the groundwater depth, the decrease of contaminant concentrations with depth, low precipitation rates, and high evaporation rates, the contamination detected in soil is not expected to affect groundwater at any of the Group A SWMUs.

HUMAN HEALTH RISK ASSESSMENT

In accordance with EPA and State of Utah guidance, the human health RA evaluated potential ***cancer risks*** and ***noncancer health effects*** from exposure to the identified COPCs. Risks and effects are considered for the various ***receptors*** (current Depot worker, current industrial worker, future construction worker, current offsite resident, future adult resident, and future child resident) under different ***exposure scenarios***.

Definition of Cancer Risks, Noncancer Health Effects, and Exposure Scenarios

The American Cancer Society has determined that the expected overall likelihood that an adult will develop cancer during a 70-year lifetime is one in three. The assessment of cancer risks for this program calculates the increased likelihood that an individual will develop cancer as a result of long-term site-related exposure to carcinogens over a 70-year lifetime.

According to EPA and UDEQ, a calculated cancer risk is unacceptable if the increased likelihood of getting cancer is greater than one in 10,000. Furthermore, a cancer risk of less than one in 1 million is considered to be acceptable and does not require remedial action. Sites with cancer risks between one in 10,000 and one in 1 million may require further consideration to determine whether ***corrective action*** is appropriate.

The assessment of noncancer health effects calculates the likelihood of risks other than cancer as a result of long-term exposure to contaminants. This is reported as a ***hazard index*** (HI). A calculated HI of less than 1.0 indicates that health effects expected from site-related contaminants are acceptable according to EPA and UDEQ standards.

Hazards may include individual weight gain or loss, organ weight changes, or changes in blood chemistry. They are usually determined based on data from animal laboratory studies or from human studies in the workplace. The term "hazards" is used to refer to noncancer health effects.

Blood lead levels are evaluated as a separate health effect and are treated the same as hazards. This evaluation uses an EPA model for lead uptake from the environment (including soil) into the human body. The U.S. Centers for Disease Control and Prevention (CDC) has established a target limit for lead concentration in children of 10 micrograms per deciliter (µg/dL) of blood in less than 5 percent of the model population. When extrapolated to adults, this limit is 11.1 µg/dL. EPA recommends that this model be used when lead levels in soil equal or exceed 400 micrograms per gram (µg/g) of soil.

Potential cancer risks and noncancer hazards are calculated for the following receptors:

- Current Depot worker
- Current industrial worker
- Future construction worker
- Current offsite resident
- Future adult resident
- Future child resident.

These receptors may be exposed to COPCs by a variety of pathways or exposure scenarios. Exposure scenarios can be real or hypothetical, current or future.

The hypothetical residential exposure scenario must be evaluated for all sites. This scenario calculates the risks and hazards for an adult and a child living at the identified site full time. It is assumed that the residents are exposed to surface soil through several pathways, including:

- Getting dirt on the skin and absorbing contaminants into the body through the skin (dermal absorption).

- Eating soil directly (children) or inadvertently ingesting soil because hands are unclean (children or adults; ingestion).

- Breathing in dust (inhalation).

- Eating fruits or vegetables grown in contaminated soil (produce ingestion).

- Eating beef from cattle that have grazed on grasses growing in contaminated soil (beef ingestion).

Using EPA exposure pathway guidelines and site-specific contaminant concentrations, it is possible to calculate the increased likelihood of developing cancer (from carcinogenic contaminants) or being exposed to hazards (from noncarcinogenic contaminants).

Risks and hazards are calculated for an onsite worker under the military land use exposure scenario. This calculation assumes that exposure may occur through ingestion, inhalation, or dermal absorption of surface soil during normal work hours. The worker is not assumed to eat food produced at the site. Also, for purposes of calculating risk, the worker is at the site fewer hours per day, fewer days per year, and fewer years than the resident. These assumptions are based on EPA guidelines and on reasonable information about TEAD workers.

A construction worker at any SWMU may encounter subsurface contaminated soil during utility installation, utility maintenance, or construction. This worker may be exposed via ingestion, dermal absorption, or inhalation; however, he or she is not exposed to contaminants in food potentially produced at the site. The construction worker exposure is generally more intense (i.e., inhalation and ingestion rates of soil are higher than for the other exposure scenarios), but of a much shorter duration – which results in comparatively lower relative risks. EPA guidelines are used in calculating the associated cancer risks and hazards for the construction worker.

Regulatory Requirements

The RFI calculated cancer risks and hazards due to COPCs for the following exposure scenarios:

- Actual current and continued military
- Future construction
- Future residential adults and children.

The State of Utah Administrative Code (UAC) 315-101, "Cleanup Action and Risk-Based Closure Standards," also referred to as the "***Risk Rule***," is used to help determine what kind of corrective measures may be required.

The first part of the Risk Rule requires that the human health RA consider the residential exposure scenario for each SWMU. It also specifies the applicable exposure pathways for this scenario. Although residential use is hypothetical, it is evaluated as the scenario most protective of human health. The Risk Rule considers calculated risk for this scenario to be unacceptable if the increased likelihood of getting cancer is greater than one in 1 million above the expected rate, if the HI is greater than 1.0, or if the modeled blood lead level is greater than the CDC limit of 10 µg/dL.

If there are no unacceptable risks or hazards under the residential scenario and all other applicable regulatory requirements are met, the site can be closed with no further action. However, corrective measures must be

evaluated if the residential scenario presents unacceptable risks or hazards.

The extent of corrective measures required is then determined by considering the actual, **reasonably anticipated future land use** (i.e., continued military). The Risk Rule considers calculated risk for reasonably anticipated future land use scenarios to be unacceptable if the increased likelihood of getting cancer is greater than one in 10,000 above the expected rate, if the HI is greater than 1.0, or if the estimated blood lead level is greater than the CDC limit of 10 µg/dL.

For those sites with unacceptable risks, hazards, or blood lead levels for the current or reasonably anticipated future land use scenario, corrective action (e.g., active cleanup such as excavation or treatment) is evaluated. However, if the calculated risks or health effects are acceptable and all other regulatory requirements are met, only ***management measures*** (e.g., ***land use*** or deed restrictions) are required.

Potential impacts to groundwater are also considered. UAC R315-101-3, the "Principle of Non-Degradation," states that active corrective measures are required to prevent further degradation of a resource, including groundwater. In addition, the results of the ecological RA and the extent and concentrations of contaminants are reviewed in selecting the most appropriate corrective measure.

A site that is determined to present an unacceptable risk or hazard for the reasonably anticipated future land use scenario is corrected to standards developed for that scenario. These standards are less stringent for military, industrial, or construction use than for residential use. Thus, in these three circumstances, contaminants may remain onsite at concentrations that – though lowered – may still present risks to the hypothetical future residential receptor. These ***residual risks*** are not addressed unless the land use changes (e.g., if one of the SWMUs slated for military use becomes residential). If this occurs, the risks and corrective measures must be reevaluated.

Results

As discussed above, the human health RA considered the hypothetical future residential exposure scenario for SWMUs 1b, 1c, 20, 21, 34, 37, 42, 45, and 48, even though the Army plans to use these sites for continued military activities. The RA identified potential risks, hazards, or blood lead levels above those allowed for the hypothetical future residential scenario under the Risk Rule at each of these SWMUs

To determine the extent of corrective measures required, the RA subsequently evaluated the current or realistic future land use exposure scenario (continued military).

Under the realistic future land use exposure scenario, no cancer risks greater than one in 10,000 were identified at any of the nine areas.

Under the realistic future land use exposure scenario, an HI above 1.0 and a 95th percentile blood lead level above the CDC target of 10 µg/dL were identified at the following SWMUs:

SWMU 21 – Deactivation Furnace Building

SWMU 42 – Bomb Washout Building.

Based on these results from the human health RA, corrective actions are evaluated for SWMUs 21 and 42. For the remaining seven Group A SWMUs management measures – at a minimum – are required. Additional factors, including regulatory requirements, may require active cleanup beyond management measures.

ECOLOGICAL RA

The ecological RA evaluated the potential effects of identified COPCs on plants and animals at the nine Group A SWMUs – focusing on the areas and receptors most at risk. The following steps are included in the RA process:

- Site characterization – which includes surveying site soil, plant life, and animal life.
- Identification of ecological COPCs and their concentrations and toxicity.
- Selection of ecological receptors – the species of plants and animals observed or potentially present at the SWMUs.
- Calculation of ecological risk based on available habitat, COPCs, and ecological receptors.

Potentially significant adverse impacts to ecological receptors were identified at:

SWMU 21 – Deactivation Furnace Building

SWMU 42 – Bomb Washout Building.

Based on these results from the ecological RA, active cleanup may be required to protect plants and animals at SWMUs 21 and 42.

The ecological risks at SWMUs 20, 37, and 45 were evaluated as moderate, but not serious enough to warrant corrective measures. The ecological risks at SWMUs 1b, 1c, 34, and 48 were evaluated as low and also do not warrant corrective measures.

CORRECTIVE MEASURES STUDY

According to the Risk Rule, each of the nine Group A SWMUs presents unacceptable risks and hazards under the hypothetical future residential land use scenario. Two SWMUs present unacceptable health effects for the reasonably anticipated future land use (i.e., military).

The CMS evaluates corrective measures (e.g., active cleanups or site controls) that are protective of both human health and the environment, and that comply with Federal, State, and local requirements. The CMS process includes:

- Development of ***corrective action objectives*** (CAOs), which are chemical-specific concentrations for each land use scenario.
- Comparison of the maximum concentrations of COPCs (i.e., chemicals detected at levels exceeding EPA guidelines, as identified in the RFI Report) to CAOs for the reasonably anticipated land use.
- Comparison of the **exposure point concentration** (EPC) for each COC to its CAO, as needed.
- Identification of potentially applicable corrective measures alternatives.
- Evaluation and comparison of these alternatives.
- Recommendation of the most appropriate alternative for each SWMU.

Corrective Action Objectives

CAOs are used to focus the development of corrective measures alternatives on technologies that are likely to achieve the desired target levels. The primary qualitative CAO is to protect human health and the environment. The corrective measure must meet the intent of Federal, State, and local regulations – in this case, the State of Utah Risk Rule (UAC R315-101, including its "Principle of Non-Degradation"), Utah's Solid Waste Facility Location Standards, Interim Status Requirements for Hazardous Waste Facilities (UAC R315-7), and TEAD's Part B permit. Also, the Munitions Rule is applicable to SWMUs 1b, 1c, and 42. UXO at these sites may need to be addressed in the future if new rules are drafted mandating the need to do so.

CAOs may also be quantitative – i.e., target cleanup concentrations for contaminants; they vary for each land use scenario because of the different receptors and exposure pathways.

Identification of Contaminants of Concern

COPCs that exceed CAOs are site-related chemicals that are determined to be responsible for elevated risks under the reasonably anticipated future land use scenario. They are referred to as ***contaminants of concern*** (COCs).

The CAO for chemicals that may cause cancer is the concentration of each compound that results in a potential calculated risk of one in 1 million – which, for military CAOs, is much stricter than the Risk Rule's acceptable value of one in 10,000. Therefore, in some cases, military COCs were identified even though the calculated risk is less than one in 10,000. CAOs are consistent with EPA's acceptable risk range as defined in the National Contingency Plan. The CAO for noncancer-causing chemicals is the concentration of each compound that results in an HI of 1.0. This is equivalent to the Risk Rule's standard. A lead concentration of 1,800 µg/g is equivalent to a blood lead level of 10 µg/dL.

The COCs are then evaluated in conjunction with results of the human health RA to determine what level of corrective measures must be evaluated. The EPC for each COC is compared to its CAO. If the EPC for a compound is less than its CAO, the maximum concentration of that chemical does not pose a human health risk.

Additional soil samples were collected at SWMUs 20 and 21 in 1999 to provide a complete soil characterization of the metal contamination at the sites. No new COCs were identified but the extent of contamination was revised based on the additional soil samples. The sampling results are presented in the CMS Report and included in the evaluation of SWMUs 20 and 21.

Under the reasonably anticipated future land use, the EPC for identified COCs are identified at levels such that they do not pose a risk at SWMUs 1b, 1c, 45, and 48 (i.e., levels of contaminants sitewide are below CAOs for that land use).

However, the EPC for identified COCs exceed their CAO levels in soil at the following SWMUs:

- Lead at SWMU 20.
- Metals at SWMU 21.
- Pesticides at SWMU 34.
- ***Semivolatile organic compounds*** (SVOCs) and dioxins/furans at SWMU 37.
- Metals, explosives, and dioxins/furans at SWMU 42.

Following Utah and EPA guidance, these COCs were evaluated for distribution and concentration.

In accordance with the Risk Rule, the following sites require an evaluation of active corrective measures:

- *SWMU 20*
  - *Lead in soil.*
- *SWMU 21*
  - *Antimony, beryllium, cadmium, and lead in soil.*
- *SWMU 34*
  - *Chlordane, DDT, and heptachlor in soil.*
- *SWMU 42*
  - *Antimony, lead, 2,4-DNT, and dioxins/furans in soil.*

Although COCs slightly above EPC levels were identified at SWMU 37, this site does not require an evaluation of active corrective measures because the EPCs for the COCs are well below their corresponding 1×10^{-4} CAO levels and the human health RA did not identify potential risks, hazards, or blood levels for the realistic future land use.

At SWMU 42, 2,4-DNT and dioxins/furans are also well below their corresponding 1×10^{-4} CAO levels.

Management measures are evaluated for SWMUs 1b, 1c, 37, 45, and 48.

Identification and Evaluation of Alternatives

The CMS identifies alternatives for each SWMU that meet the CAOs and are protective of human health and the environment. Each alternative consists of technologies or management measures that address the ***media*** of concern (e.g., groundwater, soil) and the COCs. More

than one alternative may be identified for a particular area.

Alternatives are evaluated and compared for each SWMU to determine which alternative best meets the following criteria:

- **Technical criteria**

  – Performance – evaluates whether the corrective measures alternative can perform its intended function and meet the CAOs, including compliance with Federal, State, and local regulations. This criterion considers site and waste characteristics, and addresses the useful life of each alternative (i.e., the length of time the alternative maintains its intended level of effectiveness).

  – Reliability – describes the long-term effectiveness and permanence of each alternative. This criterion evaluates the adequacy of the corrective measures alternative based on performance at similar sites, ***operation and maintenance*** (O&M) requirements, long-term environmental monitoring needs, and residuals management measures.

  – Implementability – assesses the technical and institutional feasibility of executing a corrective measures alternative, including constructability, permit and legal/regulatory requirements, availability of materials, etc. This criterion also addresses the length of time from implementation of the alternative until beneficial effects are realized.

  – Safety – considers the potential threats to workers, nearby communities, and the environment during implementation of the corrective measure.

- **Human health assessment** – evaluates the extent to which each alternative protects human health. This criterion considers the classes and concentrations of contaminants left onsite, potential exposure routes, and potentially affected populations. Residual contaminant concentrations are also compared to existing criteria, standards, or guidelines.

- **Environmental assessment** – evaluates short- and long-term effects of the corrective measure on the environment, including adverse impacts to environmentally sensitive areas.

- **Administrative feasibility** – considers compliance with applicable Federal, State, and local environmental and public health standards, requirements, criteria, or limitations.

- **Cost** – includes ***capital cost*** and annual O&M cost. Capital cost includes direct and indirect costs. Annual cost typically includes labor, maintenance, energy, and sampling/analysis. For purposes of comparison, costs are presented in terms of ***present worth***, which is the current value of a future expenditure. The cost estimates are based on conventional cost estimating guides, vendor information, and engineering judgment.

Recommended Alternatives

For each SWMU, the alternative that best protects human health and the environment, has proven reliable at other sites, and meets regulations is recommended to the public and UDEQ.

The next section presents a detailed evaluation of alternatives.

The recommended corrective measures alternatives for the nine Group A SWMUs are noted below:

- Burn Pad (SWMU 1b)
  - Land use restrictions to prevent residential use of the site.
- Trash Burn Pits (SWMU 1c)
  - Land use restrictions to prevent residential use of the site.
- AED Deactivation Furnace Site (SWMU 20)
  - Asphalt cover and land use restrictions.
- Deactivation Furnace Building (SWMU 21)
  - Asphalt cover and land use restrictions.
- Pesticide Handling and Storage Area (SWMU 34)
  - Excavation, off-post treatment/disposal, and land use restrictions.
- Contaminated Waste Processing Plant (SWMU 37)
  - Land use restrictions to prevent residential use of the site.
- Bomb Washout Building (SWMU 42)
  - Soil cover, fence, and land use restrictions.
- Stormwater Discharge Area (SWMU 45)
  - Land use restrictions to prevent residential use of the site.
- Old Dispensary Discharge – Building 400 (SWMU 48)
  - Land use restrictions to prevent residential use of the site.

SWMU SUMMARIES

The SWMU summaries present background information and results of the RFI, human health and ecological RAs, and CMS for SWMUs 1b, 1c, 20, 21, 34, 37, 42, 45, and 48.

SWMU 1b (BURN PAD)

Site Background – The Burn Pad (SWMU 1b) is located in a small erosional valley approximately 2,000 feet east of the Main Demolition Area (SWMU 1). Site activities began prior to 1959 and reportedly were discontinued before 1977. The area has since been regraded and revegetated, and is no longer used for ***demilitarization*** activities.

SWMU 1b previously consisted of a 300- by 100-foot cleared pad where propellant was burned in open trenches and projectiles were flashed. Based on historical aerial photographs from 1959, 1966, and 1978, five separate trenches were located in the pad. No permanent structures were associated with operations at the Burn Pad.

Summary of RFI – One explosive was identified as a COPC in surface soil. In subsurface soil, metals, explosives, and ***dioxins/furans*** were identified as COPCs. ***Unexploded ordnance (UXO)*** was also encountered during site investigations.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents, and an elevated HI for hypothetical future onsite child residents. No elevated cancer risks or HIs were identified for current Depot personnel or future construction workers. In addition, all projected blood lead levels were below the CDC target of 10 µg/dL.

The ecological RA concluded that the COPCs detected in soil at SWMU 1b present a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU. However, the identified risks and hazards to current Depot personnel are below $1H10^{-4}$ and 1.0, which are the levels specified in the Risk Rule as requiring active remediation. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at SWMU 1b. Therefore, also considering the results of the human health RA, only one management measures alternative – land use restrictions to prevent future residential use of the site – is evaluated for SWMU 1b.

Restrictions prohibiting future residential development of SWMU 1b will be incorporated into the TEAD ***master land use plan***. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed. The land use restrictions will include a notation that prohibit Depot worker activities from occurring at the site unless ordnance personnel have performed a UXO survey/clearance for the intended area of use. The SWMU will have signage posted to warn of UXO potential and stating the access restrictions. In addition, the entire TEAD facility is secured by fences and patrolled by guards.

Evaluation of Alternative – The application of land use restrictions at SWMU 1b meets the evaluation criteria, as detailed below:

- Technical evaluation
  - Performance – Land use restrictions limit future exposure by preventing future residential development of the site and also meet the CAOs developed in the CMS Work Plan. This corrective measures alternative is applicable to site characteristics and meets the identified CAOs with no decrease in effectiveness over time.
  - Reliability – Land use restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.
  - Implementability – Because the site is currently under military use, continuing restrictions at this site should not be difficult. This corrective measures alternative immediately meets the CAOs developed in the CMS Work Plan.
  - Safety – No intrusive activities are required for implementation of this alternative.
- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil. The residual risk remaining onsite for soil results from soil contamination at concentrations below military use CAOs, but above residential use CAOs.
- Environmental assessment – The SWERA identified no adverse effects to ecological receptors as a result of the contaminants in soil at the site.
- Administrative feasibility – The implementation of land use restrictions at this site meets the specified requirements of UAC R315-101. No violations of environmental or public health standards were identified at the site. Because SWMU 1b is to remain under U.S. Army control, land use restrictions are administered through the installation's real property planning board; therefore, this alternative is considered to be administratively feasible.
- Cost – The estimated cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of land use restrictions is the recommended alternative for the Burn Pad (SWMU 1b).

SWMU 1c (TRASH BURN PITS)

Site Background – The Trash Burn Pits (SWMU 1C) are located in the southwest corner of TEAD, in a small erosional valley 2,000 feet east of the Main Demolition Area (SWMU 1) and adjacent to the Burn Pad (SWMU 1b). The site is an open, graded, and vegetated area of approximately 45 acres, with no permanent structures.

Disposal and waste burning activities occurred at SWMU 1c from approximately 1959 to the 1980s. Disposal pits were reportedly several hundred feet long, 8- to 10-feet wide, and 4- to 6-feet deep. Containers and other wastes were identified within test pits excavated in areas of waste disposal activities dating from the 1950s and 1960s. Burn areas on the ground surface were encountered in test pits from areas of waste disposal activities dating from the 1970s and 1980s.

Summary of RFI – Metals and explosives were identified as COPCs in surface and subsurface soils. Dioxins/furans were identified as COPCs in subsurface soil only. UXO was also encountered during site investigations.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents, and elevated HIs for hypothetical future onsite child residents and future construction workers. In addition, all projected blood lead levels were below the CDC target of 10 µg/dL.

The ecological RA concluded that the COPCs detected in soil at SWMU 1c present a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU. However, the identified risks and hazards to current Depot personnel are below $1H10^{-4}$ and 1.0, which are the levels specified in the Risk Rule as requiring active remediation. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – At SWMU 1c, one explosive was identified as a COC in surface soil, and metals were identified as COCs in subsurface soil. However, the COC EPCs – which correspond to a weighted sitewide concentration – are below CAOs. Also, the elevated HI for future construction workers is due to the presence of manganese in soil at concentrations that are less than the average for the western United States. Therefore, only one management measures alternative – land use restrictions to prevent future residential use of the site – is considered for SWMU 1c.

Restrictions prohibiting future residential development of SWMU 1c will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed. The land use restrictions will include a notation that prohibit Depot worker activities from occurring at the site unless ordnance personnel have performed a UXO survey/clearance for the intended area of use. The SWMU will have signage posted to warn of UXO potential and stating the access restrictions. In addition, the entire TEAD facility is secured by fences and patrolled by guards.

Evaluation of Alternative – The application of land use restrictions at SWMU 1c meets the evaluation criteria, as detailed below:

- Technical evaluation

  - Performance – Land use restrictions limit future exposure by preventing future residential development of the site and also meet the CAOs developed in the CMS Work Plan. This corrective measures alternative is applicable to site characteristics and meets the identified CAOs with no decrease in effectiveness over time.

  - Reliability – Land use restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

  - Implementability – Because the site is currently under military use, continuing restrictions at this site should not be difficult. This corrective measures alternative immediately meets the CAOs developed in the CMS Work Plan.

  - Safety – No intrusive activities are required for implementation of this alternative.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil. The residual risk remaining onsite for soil results from soil contamination at concentrations below military use CAOs, but above residential use CAOs.

- Environmental assessment – The SWERA identified no adverse effects to ecological receptors as a result of the contaminants in soil at the site.

- Administrative feasibility – The implementation of land use restrictions at this site meets the specified requirements of UAC R315-101. No violations of environmental or public health standards were identified at the site. Because SWMU 1c is to remain under U.S. Army control, land use restrictions are administered through the installation's real property planning board; therefore, this alternative is considered to be administratively feasible.

- Cost – The estimated cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of land use restrictions is the recommended alternative for the Trash Burn Pits (SWMU 1c).

SWMU 20 (AED DEACTIVATION FURNACE SITE)

Site Background – The AED Deactivation Furnace Site (SWMU 20), which includes Buildings 1351 and 1352, is located on a 180- by 225-foot asphalt pad, along the road between the AED Demilitarization Facility (SWMU 19; Group B) and the Bomb Shell Reconditioning Building (SWMU 23; Operable Unit (OU) 8). The pad is underlain by compacted gravel fill. A small area near the western corner of the pad, which was reportedly once used to store drummed residue, is referred to as the former hazardous waste holding area.

Building 1351 has been active since approximately 1970; it includes a deactivation furnace (rotary-kiln type), a flashing furnace (installed in 1976), and a large air pollution control system (installed in 1976). Building 1352 is a small storage building. SWMU 20 is currently used to conduct treatability studies and operates under interim RCRA approval through an experimental variance.

Summary of RFI – Metals were identified as COPCs in surface and subsurface soil, and dioxins/furans were identified as COPCs in surface soil only.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents, and an elevated HI for hypothetical future onsite child residents. No elevated cancer risks or HIs were identified for current Depot personnel or future construction workers. In addition, the projected blood lead concentration for the hypothetical future onsite child resident is greater than the CDC target of 10 µg/dL.

The ecological RA concluded that the site poses a moderate ecological risk, but the risk is not unacceptable, and does not warrant corrective measures to reduce ecological risks.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU.

Identification of Corrective Measures Alternatives – At SWMU 20, antimony and lead were identified as COCs in surface soil. The EPC for lead, which represents a site-wide average concentration that a Depot worker might be exposed to, was also greater than its CAO. The EPC exceeds the CAO based on the CDC target for blood lead levels in Depot workers. Moreover, the maximum concentration of lead exceeded the CAO by more than one order of magnitude. Therefore, also considering the results of the human health RA, several corrective measures are considered for SWMU 20, as described below.

For Alternatives 2, 3, 4, and 5, although no UXO was encountered during field investigations, a UXO survey will be performed over the area of corrective measures as a safety precaution because of past demilitarization procedures at the facility.

<u>Alternative 1 – Land Use Restrictions</u>

This corrective measures alternative includes land use restrictions to prevent future residential use of the site. Restrictions prohibiting future residential development of SWMU 20 will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed.

Alternative 2 – Asphalt Cover and Land Use Restrictions

This corrective measures alternative includes installation of an asphalt cover over areas of metals contamination to prevent human exposure and contaminant migration, and annual inspections to maintain the cover.

Land use restrictions to prevent residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 3 – Excavation, Solidification/ Stabilization, and Land Use Restrictions

This corrective measures alternative includes excavation of contaminated surface soil to a depth of 1 foot using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until lead is detected at concentrations below military use CAOs.

The contaminated soil is then treated through ***solidification/stabilization***. This process binds the soil with a material such as cement to reduce the mobility of metals. The treated soil is placed within a ***corrective action management unit*** (CAMU) at the SWMU 12/15 (Known Releases) landfill. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and vegetated to natural conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 4 – Excavation, Soil Washing, and Land Use Restrictions

This corrective measures alternative includes excavation of contaminated soil at levels above military use CAOs (described in Alternative 3), treatment of the contaminated soil onsite through ***soil washing***, and off-post treatment/disposal of the soil washing residuals at an appropriate treatment, storage, and disposal facility (TSDF) or landfill. Soil washing separates fine, contaminated soil (i.e., residuals) from coarse, clean soil. The cleaned soil is then placed back into the excavated area and covered by a 6-inch compacted soil cover which is vegetated to natural conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 5 – Excavation, Off-Post Treatment/ Disposal, and Land Use Restrictions

This corrective measures alternative includes excavation of contaminated soil at levels above military use CAOs (described in Alternative 3).

If the excavated soil is classified as hazardous based on the results of a soil profile analysis (including total waste and toxicity characteristic leaching procedure (TCLP) analysis), it is transported to an off-post hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. If the soil analysis results are acceptable, the soil may be sent to a non-hazardous waste landfill.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and vegetated to natural conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Evaluation of Alternatives – The proposed corrective measures alternatives for SWMU 20 are evaluated and compared below:

- Technical evaluation

  - Performance – Alternative 5 (excavation, off-post treatment/disposal, and land use restrictions) meets both the qualitative and quantitative CAOs and is rated high with respect to performance. Alternative 3 (excavation, solidification/stabilization, and land use restrictions) and Alternative 4 (excavation, soil washing, and land use restrictions) meet both the qualitative and quantitative CAOs, but require pretreatment testing and are rated moderate with respect to performance. Alternative 2 (asphalt cover and land use restrictions) is rated moderate for performance because it is not a permanent remedy and it only meets the CAOs if the cover is properly maintained. Alternative 1 (land use restrictions) is rated low because it does not meet CAOs.

  - Reliability – Alternative 5 is rated high for reliability because it has been proven effective at other sites, and no O&M activities or long-term monitoring is required. Alternative 2 is rated moderate because it does not permanently remove site contamination, and it requires annual inspection and maintenance of the asphalt cover. Alternatives 3 and 4 are rated moderate because pretreatment testing is required to further evaluate their effectiveness and permanence, and 5-year site inspections are recommended to ensure the long-term effectiveness of the solidification/stabilization process. Alternative 1 is rated moderate because it has been proven effective at other sites to prevent residential use; however, it does not permanently remove site contamination, and it does not address Depot personnel exposure to lead-contaminated soil.

  - Implementability – Alternatives 1, 2, and 5 are rated high because they are easy to implement. Equipment, materials, and contractors required to implement Alternatives 2 and 5 are readily available locally. In addition, it is estimated that Alternatives 2 and 5 could each be completed within 2 to 3 weeks. Alternatives 3 and 4 are rated moderate because there are fewer contractors experienced in performing these treatment processes; Alternative 4 requires approximately 1 month for implementation, and Alternative 3 requires 1 to 2 months.

  - Safety – Alternatives 1 and 2 are rated high for safety because they do not require the excavation and handling of contaminated soil; therefore, they do not present a significant short-term risk to the surrounding community or on-post workers. Alternative 3 is rated moderate because – though it involves the excavation and treatment of contaminated soil – it does not include the off-post transport of hazardous materials. Alternatives 4 and 5 involve the excavation and handling of contaminated soil at the site, and the off-post shipment of either the soil or the soil-washing treatment residuals to a Class C landfill or TSDF. Each of these alternatives receives a moderate rating for safety.

- Human health assessment – Alternatives 2, 3, 4, and 5 receive a high rating for this criterion because they are protective of human health. Alternative 2 protects human health by containing the COCs at the site beneath the asphalt cover. Alternatives 3 and 4 use solidification/stabilization or soil

washing to reduce COC concentrations in the affected soil. Alternative 5 removes the contaminated soil from SWMU 20. Alternative 1 is rated low for human health because the elevated blood lead level estimated for Depot workers is not reduced to meet the applicable CDC target.

- Environmental assessment – Alternatives 2, 3, 4, and 5 each receive a high rating for this criterion because they reduce risk to ecological receptors. Alternative 1 is rated moderate because although it does not reduce ecological risk, the SWERA concluded that the ecological risks at SWMU 20 did not warrant corrective measures.

- Administrative feasibility – Alternative 2 is rated high for administrative feasibility because it is expected to meet the requirements of UAC R315-101. Alternatives 3, 4, and 5 are also expected to meet these requirements, but receive a moderate rating because soil excavation may disrupt facility operations and Alternatives 3 and 4 may require a RCRA treatment permit. Alternative 1 fails to meet regulatory requirements because of exceedance of the CDC target for blood lead levels in Depot workers. It receives a low rating.

- Cost – The estimated cost of Alternative 1 is $12,000. Of the four active corrective measures alternatives, Alternative 2 has the lowest cost, estimated at $130,000. The estimated costs of Alternatives 3, 4, and 5 are $270,000, $280,000, and $200,000, respectively.

Recommended Alternative – Alternative 2, the application of an asphalt cover and land use restrictions is the recommended alternative for the AED Deactivation Furnace Site (SWMU 20).

SWMU 21 (DEACTIVATION FURNACE BUILDING)

Site Background – The Deactivation Furnace Building (SWMU 21; Building 1320) is an ammunition demilitarization production facility constructed about 1955. It occupies 0.7 acre in the southwestern portion of TEAD and currently operates under a RCRA Part B permit. The areas that are being proposed for corrective measures were contaminated prior to the facility becoming a permitted unit. Current operations do not add to the previous contamination.

Building 1320 contains a rotary-kiln furnace that is used to deactivate small arms ammunition, primers, and fuses. Air pollution control equipment was installed around 1975 to treat emissions from the furnace. Incinerator residue (ash and metal debris) is collected at the south end of the furnace and loaded into 55-gallon drums for temporary storage. Open staging areas for support equipment and drums are located around the outside of the building. These areas are partly paved with asphalt and partly covered with gravelly soil.

Summary of RFI – Metals, dioxins/furans, and explosives were identified as COPCs in surface soil.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents. Elevated HIs were identified for hypothetical future onsite child residents, current Depot personnel, and future construction workers. In addition, all projected blood lead levels were greater than the CDC target of 10 µg/dL.

The ecological RA concluded that the COPCs detected in soil at SWMU 21 present a potentially unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU. Also, the identified hazards to the current Depot personnel and future construction workers are greater than 1.0, which is the level specified in the Risk Rule as requiring active remediation.

Identification of Corrective Measures Alternatives – At SWMU 21, metals, dioxins/ furans, and HxCDDs were identified as COCs in surface soil. The EPCs for the identified COCs were compared to their respective CAOs. Based on this comparison, four metals – antimony, beryllium, cadmium, and lead – were determined to pose unacceptable health risks. Therefore, also considering the results of the human health RA, several corrective measures are considered for SWMU 21, as described below.

For each alternative, although no UXO was encountered during field investigations, a UXO survey will be performed over the area of corrective measures as a safety precaution because of past demilitarization procedures at the facility.

<u>Alternative 1 – Asphalt Cover and Land Use Restrictions</u>

This corrective measures alternative includes installation of an asphalt cover over unpaved areas of contaminated soil to prevent human exposure and contaminant migration, and annual inspections to maintain the cover.

Land use restrictions to prevent future residential use of the site are also included. Restrictions prohibiting future residential development of SWMU 21 will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan

concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed.

Alternative 2 – Excavation, Solidification/ Stabilization, and Land Use Restrictions

This corrective measures alternative includes excavation of unpaved and asphalt covered contaminated surface soil to a depth of 1.5 feet using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until antimony, beryllium, cadmium, and lead are detected at concentrations below military use CAOs.

The contaminated soil is then treated through solidification/stabilization. This process binds the soil with a material such as cement to reduce the mobility of metals. The treated soil is placed within a CAMU at the SWMU 12/15 (Known Releases) landfill. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and covered to pre-existing conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 3 – Excavation, Soil Washing, and Land Use Restrictions

This corrective measures alternative includes excavation of unpaved and asphalt covered contaminated soil at levels above military use CAOs (described in Alternative 2), treatment of the contaminated soil onsite through soil washing, and off-post treatment/disposal of the soil washing residuals at an appropriate TSDF or landfill. Soil washing separates fine, contaminated soil (i.e., residuals) from coarse, clean soil. The cleaned soil is then placed back into the excavated area and covered by a 6-inch cover similar to pre-existing conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 4 – Excavation, Off-Post Treatment/ Disposal, and Land Use Restrictions

This corrective measures alternative includes excavation of unpaved and asphalt covered contaminated soil at levels above military industrial use CAOs (described in Alternative 2). If the excavated soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), it is transported to an off-post hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. If the soil analysis results are acceptable, the soil may be sent to a non-hazardous waste landfill.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and covered to pre-existing conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Evaluation of Alternatives – The proposed corrective measures alternatives for SWMU 21 are evaluate and compared below:

- Technical evaluation
  - Performance – Alternative 4 (excavation, off-post treatment/disposal, and land use restrictions) meets both the qualitative and quantitative CAOs and is rated high with respect to performance. Alternative 2 (excavation, solidification/ stabilization, and land use

restrictions) and Alternative 3 (excavation, soil washing, and land use restrictions) meet both the qualitative and quantitative CAOs, but require pretreatment testing and are rated moderate with respect to performance. Alternative 1 (asphalt cover and land use restrictions) is rated moderate for performance because it is not a permanent remedy and it meets the CAOs only if the cover is properly maintained.

– Reliability – Alternative 4 is rated high for reliability because the technologies have been proven effective at other sites, and no O&M activities or long-term monitoring is required. Alternative 1 is rated moderate because it does not permanently remove site contamination, and it requires annual inspection and maintenance of the asphalt cover. Alternatives 2 and 3 are rated moderate because pretreatment testing is required to further evaluate their effectiveness and permanence, and 5-year site inspections are recommended to ensure the long-term effectiveness of the solidification/ stabilization process.

– Implementability – Alternatives 1 and 4 are rated high because they are easy to implement. Required equipment, materials, and contractors are readily available locally. In addition, it is estimated that Alternatives 1 and 4 could each be completed within 2 to 3 weeks. Alternatives 2 and 3 are rated moderate because there are fewer contractors experienced in performing these treatment processes. Additionally, Alternative 2 requires 1 to 2 months for implementation. Alternative 3 requires approximately 1 month for implementation.

– Safety – Alternative 1 is rated high for safety because it does not require the excavation and handling of contaminated soil, and presents no significant short-term risk to off-post residential communities or on-post workers. Alternative 2 is rated moderate because – though it involves the excavation and treatment of contaminated soil – it does not include the off-post transport of hazardous materials. Alternatives 3 and 4 involve the excavation and handling of contaminated soil at the site, and the off-post shipment of either the soil or the soil-washing treatment residuals to a Class C landfill or TSDF. Each of these alternatives receives a moderate rating for safety.

- Human health assessment – Alternatives 1, 2, 3, and 4 receive a high rating for this criterion because they are protective of human health. Alternative 1 protects human health by containing the COCs beneath the asphalt cover. Alternatives 2 and 3 use soil washing or solidification/stabilization to reduce COC concentrations in the affected soil. Alternative 4 removes the contaminated soil from SWMU 21.

- Environmental assessment – Alternative 1 is rated high because the asphalt cover prevents ecological receptors from being exposed to contaminants at the site. Alternatives 2 and 4 are also rated high because the excavation and removal of contaminated soil are estimated to reduce the risks to ecological receptors to a generally low level. Alternatives 3 receives a moderate rating because soil washing is expected to reduce contaminant concentrations to a level that results in generally moderate ecological risks.

- Administrative feasibility – Alternative 1 is rated high because it meets the requirements of UAC R315-101. Alternatives 2, 3, and 4 are also expected to meet the requirements of this regulation, but are rated moderate because soil excavation will disrupt facility operations and Alternatives 2 and 3 may require a RCRA treatment permit.

- Cost – Of the four corrective measures alternatives, Alternative 1 has by far the lowest cost, estimated to be $230,000. The estimated costs of Alternatives 2, 3, and 4 are $480,000, $550,000, and $560,000, respectively.

Recommended Alternative – Alternative 1, the application of an asphalt cover and land use restrictions is the recommended alternative for the Deactivation Furnace Building (SWMU 21).

SWMU 34 (PESTICIDE HANDLING AND STORAGE AREA)

Site Background – The Pesticide Handling and Storage Area (SWMU 34) consists of Building 518 and a bermed concrete pad on the south side of the building. This SWMU is located in the Administration Area, in the southeastern portion of TEAD. The facility is surrounded and secured by a chainlink fence. The area enclosed by the fence is approximately 75 by 75 feet (0.13 acre).

Building 518 was used from 1942 until recently for the storage of pesticides and herbicides, and for the preparation of application mixtures. The bermed concrete pad was used for loading sprayer trucks with these mixtures and for rinsing containers. Pesticide containers and obsolete pesticides were disposed of at the Sanitary Landfill/Pesticide Disposal Area (SWMU 12/15; Known Releases) from approximately 1942 to 1980. Some activities still occur at this SWMU.

From about 1980 until 1989, pesticides wastes and containers from operational activities at SWMU 34 were disposed of at an off-post treatment and disposal facility. Drains from Building 518 reportedly connect to an 8-inch-diameter underground pipe that discharges to the Stormwater Discharge Area (SWMU 45), located approximately 4,000 feet to the northwest. According to the Phase II RFI Report, all drains have been blocked to prevent additional pesticide releases to the soil, and wastewater is now contained in a mixing sink catch-tank located on the north side of the building.

Summary of RFI – Metals and pesticides were identified as COPCs in surface and subsurface soil.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents, and an elevated HI for hypothetical future onsite child residents. No elevated cancer risks or HIs were identified for current Depot personnel and future construction workers. In addition, all projected blood lead levels were below the CDC target of 10 µg/dL.

The ecological RA concluded that the COPCs detected in soil at SWMU 34 present a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU.

Identification of Corrective Measures Alternatives – At SWMU 34, metals and pesticides were identified as COCs in surface soil. Although the EPCs for three pesticides – chlordane, heptachlor, and DDT – were greater than their CAOs, the resulting human health risks were determined to be acceptable. Nevertheless, because of the presence of several "hotspots" where the concentrations of the COCs exceeded their CAOs by an order of magnitude – and considering the results of the human health and ecological RA – three corrective measures alternatives are considered for SWMU 34, as described below.

Alternative 1 – Land Use Restrictions

This corrective measures alternative includes land use restrictions to prevent future residential use of the site. Restrictions prohibiting future residential development of SWMU 34 will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed.

Alternative 2 – Soil Cover, Fence, and Land Use Restrictions

This corrective measures alternative includes installation and annual inspection/repair of a gravel soil cover over unpaved areas of pesticides contamination to prevent human exposure and contaminant migration and to minimize erosion. The existing fence around the perimeter of the SWMU is also inspected annually, and warning signs are erected.

Land use restrictions to prevent residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 3 – Excavation, Off-Post Treatment/ Disposal, and Land Use Restrictions

This corrective measures alternative includes excavation of paved and unpaved contaminated surface soil to a depth of 1 foot using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until pesticides are detected at concentrations below military use CAOs.

If the excavated soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), it is transported to an off-post hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. If the soil analysis results are acceptable, the soil may be sent to a non-hazardous waste landfill.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and covered with gravel.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Evaluation of Alternatives – The proposed corrective measures alternatives for SWMU 34 are evaluated and compared below:

- Technical evaluation
  - Performance – Alternative 3 (excavation, off-post treatment/disposal, and land use restrictions) meets the qualitative and quantitative CAOs, and is rated high with respect to performance. Alternative 2 (soil cover, fence, and land use restrictions) is rated moderate because it is not a permanent remedy and it meets the CAOs only if the cover is properly maintained. Alternative 1 (land use restrictions) is rated moderate for performance because it only meets quantitative CAOs for SWMU 34 if a 10^{-4} risk level is considered acceptable.
  - Reliability – Alternative 3 is rated high for reliability because it has been proven effective at other sites and requires no O&M activities or long-term monitoring. Alternative 2 is rated moderate because it does not permanently remove site contamination, and it requires annual inspection and maintenance of the soil cover and fence. Alternative 1 is rated moderate because it has been proven effective at other sites to prevent residential use; however, it does not permanently remove site contamination, and it does not address Depot personnel exposure to contaminated soil.
  - Implementability – Alternatives 1, 2, and 3 are all rated high because they are easy to implement. Equipment, materials, and contractors required to implement Alternatives 2 and 3 are readily available locally. In addition, it

is estimated that Alternatives 2 and 3 could be completed within 2 weeks.

– Safety – Alternatives 1 and 2 are rated high for safety because they do not require the excavation and handling of contaminated soil, and present an insignificant short-term risk to off-post residential communities or on-post workers. Alternative 3 is rated moderate because – though it involves the excavation and handling of contaminated soil, and the off-post shipment of soil to a Class C landfill or TSDF – the amount of contaminated soil in question is very small.

- Human health assessment – Alternative 1 receives a moderate rating, while Alternatives 2 and 3 receive a high rating for this criterion because they are protective of human health. Alternative 1 prevents residential exposure by restricting future residential development of the site; but, Depot workers are still exposed to elevated pesticide concentrations. Alternative 2 protects human health by containing the COCs beneath the soil cover. Alternative 3 protects human health by removing the contaminated soil from the Depot.

- Environmental assessment – Alternatives 2 and 3 each receive a high rating for this criterion because they reduce risk to ecological receptors. Alternative 1 is rated moderate because although it does not reduce ecological risk, the SWERA concluded that the ecological risk at SWMU 34 does not warrant corrective measures.

- Administrative feasibility – Alternatives 2 and 3 are rated high because they are expected to meet the requirements of UAC R315-101-3. Alternative 1 is rated moderate because pesticides remain in soil above CAO levels.

- Cost – The estimated cost of Alternative 1 is $12,000. Of the two active corrective measures alternatives, Alternative 2 has the lower cost, estimated to be $43,000. The estimated cost of Alternative 3 is $63,000.

Recommended Alternative – Alternative 3, excavation, off-post treatment/disposal, and land use restrictions is the recommended alternative for the Pesticide Handling and Storage Area (SWMU 34).

SWMU 37 (CONTAMINATED WASTE PROCESSING PLANT)

Site Background – The Contaminated Waste Processing Plant (SWMU 37), which is located in the southwestern portion of TEAD, includes one large building (Building 1325A), a smaller storage building (Building 1325B), and paved staging and storage areas. A 4-foot-high barbed wire fence surrounds the facility, which occupies an area of approximately 150 by 125 feet.

From around 1980 until it was closed in 1990, the contaminated waste processor (CWP) was used for flashing scrap metal and incinerating pentachlorophenol (PCP)-treated wooden crates, general packaging materials, scrap resins, and fabric contaminated with explosives. It was not used for deactivating munitions. Air pollution control equipment (including dust and ash collection equipment) was installed during construction of the furnace. Metal debris from these operations was certified as clean and sent to the DRMO Storage Yard (SWMU 26; Group B) for salvage. A washwater collection system (including sump) and a storm drain system and culvert were located north of Building 1325A.

Summary of RFI – Metals, SVOCs, dioxins/furans, and explosives were identified as COPCs in surface soil. In subsurface soil, SVOCs and dioxins/furans were identified as COPCs.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents, and an elevated HI for hypothetical future onsite child residents. No elevated cancer risks or HIs were identified for current Depot personnel or future construction workers. Blood lead levels were not evaluated for any receptor at SWMU 37.

The ecological RA concluded that the site poses a moderate ecological risk, but the risk is not unacceptable, and does not warrant corrective measures to reduce ecological risks.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU. However, the identified risks and hazards to current Depot personnel are below $1H10^{-4}$ and 1.0, which are the levels specified in the Risk Rule as requiring active remediation. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – At SWMU 37, two SVOCs – benzo(a)anthracene and benzo(a)pyrene – and dioxins/furans were identified as a COCs in surface soil. However, the EPC for benzo(a)anthracene was below its CAO, and the EPC for dioxins/furans was only slightly greater than its CAO. In addition, benzo(a)pyrene was detected in only two of 27 samples, and exceeded its CAO in only one sample. Therefore, based on acceptable risk levels and isolated occurrences, and considering the results of the human health RA, only one management measures alternative – land use restrictions to prevent future residential use of the site – is evaluated for SWMU 37.

Restrictions prohibiting future residential development of SWMU 37 will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed.

Evaluation of Alternative – The application of land use restrictions at SWMU 37 meets the evaluation criteria, as detailed below:

- Technical evaluation

  - Performance – Land use restrictions limit future exposure by preventing future residential development of the site and also meet the CAOs developed in the CMS Work Plan. This corrective measures alternative is applicable to site characteristics and meets the identified CAOs with no decrease in effectiveness over time.

  - Reliability – Land use restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

  - Implementability – Because the site is currently under military use, continuing restrictions at this site should not be difficult. This corrective measures alternative immediately meets the CAOs developed in the CMS Work Plan.

  - Safety – No intrusive activities are required for implementation of this alternative.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil. The residual risk remaining onsite for soil results from soil contamination at concentrations below military use CAOs, but above residential use CAOs.

- Environmental assessment – Although this alternative does not reduce ecological risk, the SWERA concluded that the ecological risk at SWMU 37 does not warrant corrective measures.

- Administrative feasibility – The implementation of land use restrictions at this site meets the specified requirements of UAC R315-101. Because SWMU 37 is to remain under U.S. Army control, land use restrictions are administered through the installation's real property planning board; therefore, this alternative is considered to be administratively feasible.

- Cost – The estimated cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of land use restrictions is the recommended alternative for the Contaminated Waste Processing Plant (SWMU 37).

SWMU 42 (BOMB WASHOUT BUILDING)

Site Background – The Bomb Washout Building (Building 539) is located in the southeastern portion of TEAD, north of the Administration Area. Until recently, it was used for storage. The building previously contained a demilitarization furnace for small arms munitions.

From the early 1940s to 1960, projectiles from small arms were burned in the furnace; lead was reclaimed in troughs located beneath the furnace. Because the smokestack did not have air pollution controls, heavy particulates settled into a "drop-out box" located on the roof. The furnace was dismantled in 1960.

When Building 539 was cleaned, washwater was discharged via a steel-lined concrete flume that extends from the northeast corner of the building. The flume runs east-west approximately 10 feet north of the building and discharges to an open ditch to the west. The ditch extends approximately 600 feet to a former unlined holding pond south of the main line railroad tracks. The pond, which is currently overgrown, is 50 feet in diameter and 1 to 2 feet deep.

At the time of the Phase II RFI, Building 539 had been renovated, and was a vehicle washing and staging facility for the U.S. Marine Corps. A concrete parking area was added to the south of the building, and a chainlink security fence was placed around the perimeter.

Another furnace, reportedly the same size as the one in Building 539, was located approximately 225 feet to the north and operated during the same period. It was not enclosed, and was used to incinerate fuses and small munitions. In addition, two deactivation furnaces were located in Building 520 (located east of Building 539) from the 1950s to 1967. These two furnaces were used for popping primers and melting lead for recycling; furnace emissions were exhausted through 25- to 30-foot-high smokestacks.

Summary of RFI – Metals and explosives were identified as COPCs in surface and subsurface soil. Dioxins/furans were identified as COPCs in surface soil only. UXO was also encountered during site investigations.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents. Elevated HIs were identified for hypothetical future onsite child residents, current Depot personnel, and future construction workers. In addition, all projected blood lead levels were greater than the CDC target of 10 μg/dL.

The ecological RA concluded that the COPCs detected in soil at SWMU 42 present a potentially unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU. Also, the identified hazards to current Depot personnel and future construction workers are greater than 1.0, which is the level specified in the Risk Rule as requiring active remediation.

Identification of Corrective Measures Alternatives – At SWMU 42, metals were identified as COCs in surface and subsurface soil, and explosives and dioxins/furans were identified as COCs in surface soil only. The EPCs for the identified COCs were compared to their respective CAOs. Based on this comparison, lead and antimony were determined to pose unacceptable health risks. Therefore, also considering the results of the human health RA, several corrective measures

alternatives are considered for SWMU 42, as described below.
For each alternative, a UXO clearance will be performed over the areas where corrective actions will occur because UXO has been encountered at this site.

Alternative 1 – Soil Cover, Fence, and Land Use Restrictions

This corrective measures alternative includes installation and annual inspection/repair of a soil cover over areas of soil contamination to prevent human exposure and contaminant migration. The existing fence around the perimeter of the SWMU is also inspected annually, and signs are erected.

Contaminated soil from several isolated hot spots are excavated and placed within the ditch and former holding pond areas of contamination. The soil cover (with a PVC liner) is then placed over these consolidated soil areas. The covered areas are graded and vegetated to natural conditions.

This alternative also includes land use restrictions to prevent future residential use of the site. Restrictions prohibiting future residential development of SWMU 42 will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed. The land use restrictions will include a notation that prohibit Depot worker activities from occurring at the site unless ordnance personnel have performed a UXO survey/clearance for the intended area of use. The SWMU will have signage posted to warn of UXO potential and stating the access restrictions. In addition, the entire TEAD facility is secured by fences and patrolled by guards.

Alternative 2 – Excavation, Solidification/ Stabilization, and Land Use Restrictions

This corrective measures alternative includes excavation of contaminated surface soil to an average depth of 3 feet using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until antimony and lead are detected at concentrations below military use CAOs.

The contaminated soil is then treated through solidification/stabilization. This process binds the soil with a material such as cement to reduce the mobility of metals. The treated soil is placed within a CAMU at the SWMU 12/15 (Known Releases) landfill. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and vegetated to natural conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 3 – Excavation, Soil Washing, and Land Use Restrictions

This corrective measures alternative includes excavation of contaminated soil at levels above military use CAOs (described in Alternative 2), treatment of the contaminated soil onsite through soil washing, and off-post treatment/disposal of the soil washing residuals at an appropriate TSDF or landfill. Soil washing separates fine, contaminated soil (i.e., residuals) from coarse, clean soil. The cleaned soil is then be placed back into the excavated area, and covered by a 6-inch compacted soil cover which is vegetated to natural conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Alternative 4 – Excavation, Off-Post Treatment/ Disposal, and Land Use Restrictions

This corrective measures alternative includes excavation of contaminated soil at levels above military use CAOs (described in Alternative 2).

If the excavated soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), it is transported to an off-post hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. If the soil analysis results are acceptable, the soil may be sent to a non-hazardous waste landfill.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and vegetated to natural conditions.

Land use restrictions to prevent future residential use of the site (described in Alternative 1) are also part of this alternative.

Evaluation of Alternatives – The proposed corrective measures alternatives for SWMU 42 are evaluated and compared below:

- Technical evaluation

  – Performance – Alternative 4 (excavation, off-post treatment/disposal, and land use restrictions) meets both the qualitative and quantitative CAOs and is rated high with respect to performance. Alternative 2 (excavation, solidification/ stabilization, and land use restrictions) and Alternative 3 (excavation, soil washing, and land use restrictions) meet both the qualitative and quantitative CAOs, but require pretreatment testing and are rated moderate with respect to performance. Alternative 1 (soil cover, fence, and land use restrictions) is rated moderate for performance because it is not a permanent remedy and it only meets the CAOs if the cover is properly maintained.

  – Reliability – Alternative 4 is rated high for reliability because the technologies have been proven effective at other sites, and no O&M activities or long-term monitoring is required. Alternative 1 is rated moderate because it does not permanently remove site contamination, and it requires annual inspection and maintenance of the fence and soil cover. Alternatives 2 and 3 are rated moderate because pretreatment testing is required to further evaluate their effectiveness and permanence, and 5-year site inspections are recommended to ensure the long-term effectiveness of the solidification/ stabilization process.

  – Implementability – Alternatives 1 and 4 are rated high because they are easy to implement. Equipment, materials, and contractors required for implementation are readily available locally. It is estimated that Alternative 1 could be completed within 4 to 6 weeks and Alternative 4 within 1 month. Alternatives 2 and 3 are rated moderate because there are fewer contractors experienced in performing these treatment processes. It is estimated that Alternatives 2 and 3 require 2 to 4 months for implementation.

  – Safety – Alternative 1 is rated moderate for safety because it requires UXO clearance, limited excavation and handling of contaminated soil, and no off-post transport of hazardous

materials; it presents no significant short-term risk to off-post residential communities or on-post workers. Alternative 2 is rated moderate because it requires UXO clearance, and involves the excavation and treatment of contaminated soil; it does not include the off-post transport of hazardous materials. Because Alternatives 3 and 4 require UXO clearance, and involve the excavation and handling of contaminated soil, and the off-post shipment of either the soil or the soil-washing treatment residuals to a Class C landfill or TSDF, they are rated low.

- Human health assessment – Alternatives 1, 2, 3, and 4 are protective of human health. Alternative 1 protects human health by containing the COCs at the site beneath the soil cover. Alternative 2 prevents both short- and long-term exposure to untreated soil through solidification/stabilization. Alternative 3 uses soil washing to reduce COC concentrations in the impacted soil. Alternative 4 removes the contaminated soil from SWMU 42. Each of these alternatives receives a high rating for protection of human health.

- Environmental assessment – Alternative 1 is rated high for environmental protection because the soil cover minimizes the exposure of ecological receptors to contaminants at the site. Alternatives 2 and 4 are also rated high because excavation and removal of the contaminated soil are estimated to reduce the risks to ecological receptors to a low level. Alternative 3 is rated moderate because soil washing is estimated to result in low-to-moderate risks to ecological receptors.

- Administrative feasibility – Alternatives 1 and 4 are rated high for administrative feasibility because they meet the requirements of UAC R315-101. Alternatives 2 and 3 receive a moderate rating; though they are expected to meet the requirements of this regulation, they may require a RCRA treatment permit.

- Cost – Of the four corrective measures alternatives, Alternative 1 has by far the lowest cost, estimated to be $520,000. The estimated costs of Alternatives 2, 3, and 4 are $1,280,000, $1,630,000, and $2,120,000, respectively.

Recommended Alternative – Alternative 1, the application of a soil cover, fence, and land use restrictions is the recommended alternative for the Bomb Washout Building (SWMU 42).

SWMU 45 (STORMWATER DISCHARGE AREA)

Site Background – The Stormwater Discharge Area (SWMU 45) is located approximately 2,500 feet northwest of the Administration Area. It occupies approximately 2 acres, and includes an unlined earthen basin and associated pipelines from the Administration Area's stormwater collection system.

Stormwater has been discharged to SWMU 45 since TEAD's construction in 1942. The storm drain system consists of 10,000 linear feet of subsurface pipelines, which are included in the SWMU boundary. Although no industrial operations were performed at SWMU 45, it received discharges from the carpenter shop, sign shop, motor pool, rail shop, and SWMU 34 (Pesticide Handling and Storage Area). During the Phase II RFI, ponded stormwater was observed, though it dries up during the summer months.

Summary of RFI – Metals were identified as COPCs in surface and subsurface soil. Other COPCs include inorganics, SVOCs, and ***volatile organic compounds*** (VOCs) in surface water, and metals in sediment.

Summary of RAs – The human health RA identified cancer risks greater than the target value of 1×10^{-6} for hypothetical future onsite adult residents, and an elevated HI for hypothetical future onsite child residents. No elevated cancer risks or HIs were identified for current Depot personnel or future construction workers. In addition, the projected blood lead level for hypothetical future child residents is greater than the CDC target of 10 µg/dL.

The ecological RA concluded that the site poses a moderate ecological risk, but the risk is not unacceptable, and does not warrant corrective measures to reduce ecological risks. The ecological RA also concluded that corrective measures, if performed, would damage valuable wildlife habitat.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU. However, the identified risks and hazards to current Depot personnel are below 1×10^{-4} and 1.0, which are the levels specified in the Risk Rule as requiring active remediation. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternatives – No COCs were identified at SWMU 45. Therefore, only one management measures alternative – land use restrictions to prevent future residential use of the site – is evaluated for SWMU 45.

Restrictions prohibiting future residential development of SWMU 45 will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed.

Evaluation of Alternative – The application of land use restrictions at SWMU 45 meets the evaluation criteria, as detailed below:

- Technical evaluation
  - Performance – Land use restrictions limit future exposure by preventing future residential development of the site and also meet the CAOs developed in the CMS Work Plan. This corrective measures alternative is applicable to site characteristics and meets the identified

CAOs with no decrease in effectiveness over time.

- Reliability – Land use restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

- Implementability – Because the site is currently under military use, continuing restrictions at this site should not be difficult.

- Safety – No intrusive activities are required for implementation of this alternative.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil. The residual risk remaining onsite for soil results from soil contamination at concentrations below military use CAOs, but above residential use CAOs.

- Environmental assessment – Although this alternative does not reduce ecological risk, the ecological RA concluded that the ecological risk at SWMU 45 does not warrant corrective measures. The ecological RA also concluded that corrective measures, if performed, would damage valuable wildlife habitat.

- Administrative feasibility – The implementation of land use restrictions at this site meets the specified requirements of UAC R315-101. Because SWMU 45 is to remain under U.S. Army control, land use restrictions are administered through the installation's real property planning board; therefore, this alternative is considered to be administratively feasible.

- Cost – The estimated cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of land use restrictions is the recommended alternative for the Stormwater Discharge Area (SWMU 45).

SWMU 48 (OLD DISPENSARY DISCHARGE – BUILDING 400)

Site Background – The Old Dispensary Discharge – Building 400 (SWMU 48) is located approximately 300 feet northwest of the present TEAD clinic, in the Administration Area. It is a flat, grass-covered area of approximately 8.2 acres.

SWMU 48 was the site of the former TEAD dispensary (Building 400) and nine smaller buildings. The dispensary was constructed in 1945 and originally served as the facilities administration building; it was later used as a hospital for TEAD. Building 400 included operating rooms, a sterilization room, X-ray rooms, and a dental office. The development of X-rays at the former dispensary may have generated contaminated waste. Although plans for Building 400 indicate that waste streams from X-ray operations were discharged to the sanitary sewer system, there is a possibility that these or other wastes were disposed of into the adjacent stormwater lines.

In the mid 1980s, the former dispensary and other buildings were razed to facilitate construction of the present clinic. Other improvements at SWMU 48 included an asphalt parking lot, and water, sewer, and stormwater lines.

Summary of RFI—Metals, pesticides, and SVOCs were identified as COPCs in shallow soil.

Summary of RAs – The human health RA identified cancer risks greater than the target value of $1H10^{-6}$ for hypothetical future onsite adult residents, and an elevated HI for hypothetical future onsite child residents. No elevated cancer risks or HIs were identified for current Depot personnel and future construction workers.

The ecological RA concluded that the COPCs detected in soil at SWMU 48 present a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for hypothetical future onsite residents, the Risk Rule requires that corrective measures be evaluated for this SWMU. However, the identified risks and hazards to current Depot personnel are below $1H10^{-4}$ and 1.0, which are the levels specified in the Risk Rule as requiring active remediation. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternatives – No COCs were identified at SWMU 48. Therefore, only one management measures alternative – land use restrictions to prevent future residential use of the site – is evaluated for SWMU 48.

Restrictions prohibiting future residential development of SWMU 48 will be incorporated into the TEAD master land use plan. Any subsequent revisions to the master plan concerning this site require the reevaluation of RFI and CMS results to protect future workers. Periodic inspections will ensure restrictions are being observed.

Evaluation of Alternative – The application of land use restrictions at SWMU 48 meets the evaluation criteria, as detailed below:

- Technical evaluation
  - Performance – Land use restrictions limit future exposure by preventing future residential development of the site and also meet the CAOs developed in the CMS Work Plan. This corrective measures alternative is applicable to site characteristics and meets the identified

CAOs with no decrease in effectiveness over time.

- Reliability – Land use restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

- Implementability – Because the site is currently under military use, continuing restrictions at this site should not be difficult. This corrective measures alternative immediately meets the CAOs developed in the CMS Work Plan.

- Safety – No intrusive activities are required for implementation of this alternative.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil. The residual risk remaining onsite for soil results from soil contamination at concentrations below military use CAOs, but above residential use CAOs.

- Environmental assessment – The SWERA (Rust E&I, 1997) identified no adverse effects to ecological receptors as a result of the contaminants in soil at the site.

- Administrative feasibility – The implementation of land use restrictions at this site meets the specified requirements of UAC R315-101. Because SWMU 48 is to remain under U.S. Army control, land use restrictions are administered through the installation's real property planning board; therefore, this alternative is considered to be administratively feasible.

- Cost – The estimated cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of land use restrictions is the recommended alternative for the Old Dispensary Discharge – Building 400 (SWMU 48).

PROPOSED ALTERNATIVES

The recommended alternatives for each of the nine Group A SWMUs are listed below. Table 1 presents a comparative analysis of the alternatives considered for each SWMU.

- SWMU 1b (Burn Pad)
  - Land use restrictions
- SWMU 1c (Trash Burn Pits)
  - Land use restrictions
- SWMU 20 (AED Deactivation Furnace Site)
  - Asphalt cover and land use restrictions
- SWMU 21 (Deactivation Furnace Building)
  - Asphalt cover and land use restrictions
- SWMU 34 (Pesticide Handling and Storage Area)
  - Excavation, off-post treatment/disposal, and land use restrictions
- SWMU 37 (Contaminated Waste Processing Plant)
  - Land use restrictions
- SWMU 42 (Bomb Washout Building)
  - Soil cover, fence, and land use restrictions
- SWMU 45 (Stormwater Discharge Area)
  - Land use restrictions
- SWMU 48 (Old Dispensary Discharge Building 400)
  - Land use restrictions

TABLE 1

Summary of Comparative Analysis of Corrective Measures Alternatives
Group A Suspected Releases SWMUs
Tooele Army Depot

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
SWMU 1B BURN PAD								
Land use restrictions	Meets all identified CAOs	No O&M or long-term monitoring required	Easily implemented under current conditions	Not of concern	Protective of human health	Environmental impacts identified as low	Meets requirements of UAC R315-101	12,000
SWMU 1C TRASH BURN PITS								
Land use restrictions	Meets all identified CAOs	No O&M or long-term monitoring required	Easily implemented under current conditions	Not of concern	Protective of human health	Environmental impacts identified as low	Meets requirements of UAC R315-101	12,000
SWMU 20 AED DEACTIVATION FURNACE SITE								
Alternative 1: Land use restrictions	Does not meet identified CAOs	No O&M or long-term monitoring required	Easily implemented under current conditions	Not of concern	Not protective of human health due to elevated blood lead level	Does not reduce ecological risk which is moderate but not unacceptable	Does not meet requirements of UAC R315-101 due to exceedance of CDC target for blood lead level	12,000
Alternative 2: Asphalt cover and land use restrictions	Meets all identified CAOs if cover is properly maintained	Proven effective at other sites; requires annual inspection and maintenance of asphalt cover	Easily implemented	Negligible short-term risk	Protective of human health	Further reduces ecological risk	Meets requirements of UAC R315-101	130,000
Alternative 3: Excavation, solidification/stabilization, and land use restrictions	Meets all identified CAOs, but pretreatment testing is required	Proven effective at other sites for meeting TCLP requirements, 5-year inspections recommended to confirm long-term effectiveness	Implementation by commercial contractors available, but number of experienced vendors may be limited	Low short-term risk to workers	Protective of human health	Further reduces ecological risk	Meets requirements of UAC R315-101; may require RCRA permit	270,000
Alternative 4: Excavation, soil washing, and land use restrictions	Meets all identified CAOs, but pretreatment testing is required	Proven effective at other sites; requires no O&M or long-term monitoring	Implementation by commercial contractors available, but number of experienced vendors may be limited	Moderate short-term risk to off-post residential communities and workers	Protective of human health	Further reduces ecological risk	Meets requirements of UAC 315-101; may require RCRA permit	280,000
Alternative 5: Excavation, off-post treatment/ disposal, and land use restrictions	Meets all identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite; these activities are required at off-post landfill	Implementation by commercial contractors readily available; Subtitle C landfill and TSDF within 100 miles	Moderate short-term risk to off-post residential communities and workers	Protective of human health	Further reduces ecological risk	Meets requirements of UAC R315-101	200,000

TABLE 1 (cont'd)

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
SWMU 21 DEACTIVATION FURNACE BUILDING								
Alternative 1: Asphalt cover and land use restrictions	Meets all identified CAOs if cover is properly maintained	Proven effective at other sites; requires annual inspection and maintenance of asphalt cover	Easily implemented	Negligible short-term risk	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC R315-101	230,000
Alternative 2: Excavation, solidification/stabilization, and land use restrictions	Meets all identified CAOs, but pretreatment testing is required	Proven effective at other sites for meeting TCLP requirements; requires 5-year inspections to confirm long-term effectiveness	Implementation by commercial contractors available, but number of experienced vendors may be limited	Low short-term risk to workers	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC R315-101; may require RCRA permit, disrupts furnace operations	480,000
Alternative 3: Excavation, soil washing, and land use restrictions	Meets all identified CAOs, but pretreatment testing is required	Proven effective at other sites; requires no O&M or long-term monitoring	Implementation by commercial contractors available, but number of experienced vendors may be limited	Moderate short-term risk to off-post residential communities and workers	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC 315-101; may require RCRA permit, disrupts furnace operations	550,000
Alternative 4: Excavation, off-post treatment/ disposal, and land use restrictions	Meets all identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite; these activities are required at off-post landfill	Implementation by commercial contractors readily available; Subtitle C landfill and TSDF within 100 miles	Moderate short-term risk to off-post residential communities and workers	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC R315-101, disrupts furnace operations	560,000
SWMU 34 PESTICIDE HANDLING AND STORAGE AREA								
Alternative 1: Land use restrictions	Does not meet identified CAOs	No O&M or long-term monitoring required	Easily implemented under current conditions	Not of concern	Not protective of Depot worker human health	Environmental impacts identified as low	Does not meet requirements of UAC R315-101-3 because COCs can migrate to other media	12,000
Alternative 2: Soil cover, fence, and land use restrictions	Meets all identified CAOs if cover is properly maintained	Proven effective at other sites; requires annual inspection and maintenance of soil cover and fence	Easily implemented	Negligible short-term risk	Protective of human health	Environmental impacts identified as low, further reduces risk	Meets requirements of UAC R315-101	43,000
Alternative 3: Excavation, off-post treatment/disposal, and land use restrictions	Meets all identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite; these activities are required at off-post landfill	Implementation by commercial contractors readily available; Subtitle C landfill and TSDF within 100 miles	Low short-term risk to off-post residential communities and workers	Protective of human health	Environmental impacts identified as low, further reduces risk	Meets requirements of UAC R315-101	63,000

TABLE 1 (cont'd)

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
SWMU 37 CONTAMINATED WASTE PROCESSING PLANT								
Land use restrictions	Meets all identified CAOs	Requires no O&M or long-term monitoring	Easily implemented under current conditions	Not of concern	Protective of human health	Environmental impacts identified as moderate but not unacceptable	Meets requirements of UAC R315-101	12,000
SWMU 42 BOMB WASHOUT BUILDING								
Alternative 1: Soil cover, fence, and land use restrictions	Meets all identified CAOs if cover is properly maintained	Proven effective at other sites; requires annual inspection and maintenance of soil cover and fence	Easily implemented	Low short-term risk to workers, UXO concerns	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC R315-101	520,000
Alternative 2: Excavation, solidification/stabilization, and land use restrictions	Meets all identified CAOs, but pretreatment testing is required	Proven effective at other sites for meeting TCLP requirements, requires 5-year inspections to confirm long-term effectiveness	Implementation by commercial contractors available, but number of experienced vendors may be limited	Low short-term risk to workers, UXO concerns	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC R315-101; may require RCRA permit	1,280,000
Alternative 3: Excavation, soil washing, and land use restrictions	Meets all identified CAOs, but pretreatment testing is required	Proven effective at other sites; requires no O&M or long-term monitoring	Implementation by commercial contractors available, but number of experienced vendors may be limited	Moderate short-term risk to off-post residential communities and workers, UXO concerns	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC 315-101; may require RCRA permit	1,630,000
Alternative 4: Excavation, off-post treatment/disposal, and land use restrictions	Meets all identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite; these activities are required at off-post landfill	Implementation by commercial contractors readily available; Subtitle C landfill and TSDF within 100 miles	Moderate short-term risk to off-post residential communities and workers, UXO concerns	Protective of human health	Reduces ecological risk to acceptable levels	Meets requirements of UAC R315-101	2,120,000
SWMU 45 STORMWATER DISCHARGE AREA								
Land use restrictions	Meets all identified CAOs	Requires no O&M or long-term monitoring	Easily implemented under current conditions	Not of concern	Protective of human health	Environmental impacts identified as moderate but not unacceptable	Meets requirements of UAC 315-101	12,000
SWMU 48 OLD DISPENSARY DISCHARGE – BUILDING 400								
Land use restrictions	Meets all identified CAOs	Requires no O&M or long-term monitoring	Easily implemented under current conditions	Not of concern	Protective of human health	Environmental impacts identified as low	Meets requirements of UAC R315-101	12,000

(a) The preferred corrective measures alternative for each SWMU is shown in bold italic type.

WORD NOTEBOOK

Background: Constituent concentrations in environmental samples collected from surrounding areas not affected by site activities.

Base realignment and closure (BRAC): Program under which the U.S. Army facilitates and promotes conversion of excess Army facilities and property to private or public sector reuse.

Blood lead level: Concentration of lead in blood, usually measured in micrograms per deciliter.

Cancer risk: Increased likelihood that an individual will develop cancer as a result of site-related exposure over a 70-year lifetime.

Capital cost: Direct construction costs, such as labor and materials; plus indirect costs, such as engineering and permitting.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Established a program to identify and clean up sites where hazardous substances have been or may have been released to the environment. This Act is commonly known as Superfund.

Contaminant of concern (COC): Chemical present at levels above its numerical CAO.

Contaminant of potential concern (COPC): Chemical present at levels above background or EPA or State guidelines. Determined during the RFI phase of the RCRA process; all COPCs were included in the human health and ecological RAs.

Corrective action: Action that physically changes the site to meet CAOs. See "management measure."

Corrective action management unit (CAMU): Area of a facility that is used only for managing remediation waste as part of corrective action or cleanup.

Corrective action objective (CAO): Goal for protecting human health and the environment. A quantitative CAO is the numerical goal for cleanup of media (e.g., soil, water).

Corrective action permit (CAP): Specifically for TEAD, a permit issued by the State in January 1991 to address the cleanup of contaminated groundwater; required the Army to investigate the possible contamination of 39 SWMUs at TEAD.

Corrective measure: Management control or technology to clean up or minimize the migration of contaminants or to reduce exposure to humans/wildlife.

Corrective measures study (CMS): Component of the RCRA process that identifies, screens, and compares corrective measures alternatives for site-specific contamination and risk.

Decision Document: Presents the preferred corrective measures alternatives for selected sites; required as public participation responsibilities under RCRA.

Demilitarization: Destruction of explosives and other weapons using processes such as burning in a furnace or steam removal.

Dioxin/furan: Member of a family of toxic chlorinated aromatic hydrocarbons/ colorless, mildly toxic organic heterocyclic compound.

Ecological risk assessment (RA): Process to identify all components of the biological system at a defined site and to determine the potential effects of contaminants.

Exposure point concentration (EPC): Statistically derived value representing the likely concentration that an individual is exposed to if he or she is working or living in the area of the SWMU.

Exposure scenario: Combination of an exposure pathway (i.e., release point to receptor) and receptor-specific variables (intake, contact rate, body weight, and exposure frequency).

Federal facility agreement (FFA): Legal document that describes the rules and responsibilities of the Army, EPA, and State of Utah in determining risks and providing agreed-upon corrective action.

Hazard index (HI): Likelihood of adverse health effects from exposure to chemicals that do not cause cancer. HI values less than 1.0 indicate a low likelihood; greater than 1.0, a high likelihood.

Land use restriction: Restriction that limits the actual use of an area; applicable to sites that are not part of the BRAC program; incorporated into the TEAD master land use plan.

Management measure: Control such as fencing, land use restrictions, or monitoring that includes no physical removal or treatment of identified contaminants.

Media: Elements of the environment, such as soil, sediment, groundwater, surface water, and air.

Master land use plan: Plan maintained by each Federal facility that specifies land use. This document must be reviewed prior to obtaining the planning documents required for approval of new construction.

National Priority List (NPL): Established by EPA, a list that identifies sites eligible for remedial action under CERCLA. EPA has a structured program for evaluating sites and placing them on the NPL.

Noncancer health effect: Adverse health effect, other than cancer – may include weight loss or gain, organ changes, or blood chemistry changes.

Operation and maintenance (O&M): Annual operation and maintenance, including labor and materials.

Present worth: If invested at the start of a project, the amount of money that is sufficient to cover all costs (capital costs and annual O&M) over the planned life of the corrective measure.

Range Rule: Proposed rule for addressing safety, human health, and the environment at closed, transferred, and transferring military ranges.

RCRA facility investigation (RFI): Component of the RCRA process that identifies the types, amounts, and locations of contaminants.

RCRA Part B permit: Permit issued by the State for operation of hazardous waste facilities; TEAD maintains a RCRA Part B permit for operation of the sewage lagoons and the open burn areas.

RCRA post-closure permit: Permit issued by the State that defines actions required at a closed RCRA site.

Reasonably anticipated future use: A realistic assessment of land use from a consensus of community and local planning authorities, based on federal/state land use designation, comprehensive community master plans, and zoning laws or maps.

Receptor: Human, plant, or animal at the receiving end of an exposure pathway.

Residual risk: Risk from materials or chemicals remaining onsite.

Resource Conservation and Recovery Act (RCRA): Provides a regulatory program for active sites to prevent mismanagement of hazardous solid waste.

Risk assessment (RA): Appraisal of the actual or potential effects of a hazardous waste SWMU on human health and the environment.

"Risk Rule": State of Utah regulation, "Cleanup Action and Risk-Based Closure Standards" (UAC R315-101).

Semivolatile organic compound (SVOC): Class of organic compounds that is analyzed as a group and is comparatively heavier (i.e., less volatile) than VOCs.

Soil washing: Engineering technique for separating fine, contaminated soil from coarse, clean soil particles.

Solidification/stabilization: Engineering technique for binding soil with a material such as cement to reduce the mobility of metals.

Solid waste management unit (SWMU): Area where hazardous substances, pollutants, and contaminants may have been disposed.

Volatile organic compound (VOC): Class of organic compounds that is analyzed as a group and is comparatively lighter (i.e., more volatile) than SVOCs.

Unexploded ordnance (UXO): Anything related to munitions that has failed to function as designed, or has been abandoned or discarded, and is still capable of functioning and causing injury to personnel or damage to material.

ACRONYMS AND ABBREVIATIONS

AED	Ammunition Engineering Directorate
BRAC	Base Realignment and Closure
CAMU	Corrective action management unit
CAO	Corrective action objective
CAP	Corrective Action Permit
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
COC	Contaminant of concern
COPC	Contaminant of potential concern
CWP	Contaminated waste processor
DDE	Dichloro-diphenyl-dichloroethylene
DDT	Dichloro-diphenyl-trichloroethane
DNT	Dinitrotoluene
DOT	U.S. Department of Transportation
DRMO	Defense Reutilization Marketing Office
EPA	U.S. Environmental Protection Agency
EPC	Exposure point concentration
FFA	Federal Facility Agreement
HI	Hazard index
HxCDD	Hexachlorodibenzo-p-dioxin
IWL	Industrial Waste Lagoon
µg/dL	Microgram per deciliter
µg/g	Microgram per gram
NPL	National Priority List
O&M	Operation and maintenance
PCP	Pentachlorophenol

ACRONYMS AND ABBREVIATIONS (cont'd)

RA	Risk Assessment
RCRA	Resource Conservation and Recovery Act
RDX	Cyclotrimethylenetrinitramine
RFI	RCRA Facility Investigation
SVOC	Semivolatile organic compound
SWERA	Sitewide ecological risk assessment
SWMU	Solid waste management unit
TCLP	Toxicity characteristic leaching procedure
TEAD	Tooele Army Depot
TEAD-N	Tooele Army Depot - North Area
TSDF	Treatment, storage, and disposal facility
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
UXO	Unexploded Ordnance
VOC	Volatile organic compound

GLOSSARY OF EVALUATION CRITERIA

Technical criteria

Performance – evaluates whether the corrective measures alternative can perform its intended function and meet the CAOs, including compliance with Federal, State, and local regulations. This criterion considers site and waste characteristics, and addresses the useful life of each alternative (i.e., the length of time the alternative maintains its intended level of effectiveness).

Reliability – describes the long-term effectiveness and permanence of each alternative. This criterion evaluates the adequacy of the corrective measures technology based on performance at similar sites, O&M requirements, long-term environmental monitoring needs, and residuals management measures.

Implementability – assesses the technical and institutional feasibility of executing a corrective measures alternative, including constructability, permit and legal/regulatory requirements, availability of materials, etc. This criterion also addresses the length of time from implementation of the alternative until beneficial effects are realized.

Safety – considers the potential threats to workers, nearby communities, and the environment during implementation of the corrective measure.

Human health assessment – evaluates the extent to which each alternative protects human health. This criterion considers the classes and concentrations of contaminants left onsite, potential exposure routes, and potentially affected populations. Residual contaminant concentrations are also compared to existing criteria, standards, or guidelines.

Environmental assessment – evaluates short- and long-term effects of the corrective measure on the environment, including adverse impacts to environmentally sensitive areas.

Administrative feasibility – considers compliance with applicable Federal, State, and local environmental and public health standards, requirements, criteria, or limitations.

Cost – presents capital and annual O&M costs for each corrective measures alternative. Capital costs include direct and indirect costs. Annual O&M costs typically include labor, maintenance, energy, and sampling/analysis. For purposes of comparison, costs are presented in terms of present worth, which is the current value of a future expenditure. The cost estimates are based on conventional cost estimating guides, vendor information, and engineering judgment.

MAILING LIST

The TEAD Environmental Management Division maintains a mailing list of people interested in activities related to the Group A SWMUs. If you did not receive this Decision Document by mail and want your name added to the mailing list, or if you want your name deleted, please indicate below and mail the completed form to:

Larry McFarland/SDSTE-IRE
Environmental Management Division
Tooele Army Depot, Building T8
Tooele, UT 84074-5000

Name: _____

Affiliation (if any): _____

Address: _____

City: _____ State: ____ Zip Code: _____

__ Please add my name to the mailing list.

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SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 1b

The selected corrective measures alternative for the Burn Pad (SWMU 1b) is land use restrictions. The total cost of this management measure is estimated at $12,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 1b

Because this corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 1c

The selected corrective measures alternative for the Trash Burn Pits (SWMU 1c) is land use restrictions. The total cost of this management measure is estimated at $12,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 1c

Because this corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 20

The selected corrective measures alternative for the AED Deactivation Furnace Site (SWMU 20) is asphalt cover and land use restrictions. The total cost of this action is estimated at $130,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 20

The selected corrective measure for the AED Deactivation Furnace Site is protective of human health and the environment, attains Federal and State requirements, and is cost effective. The selected corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. Land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 21

The selected corrective measures alternative for the Deactivation Furnace Building (SWMU 21) is asphalt cover and land use restrictions. The total cost of this action is estimated at $230,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 21

The selected corrective measure for the Deactivation Furnace Building is protective of human health and the environment, attains Federal and State requirements, and is cost effective. The selected corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. Land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 34

The selected corrective measures alternative for the Pesticide Handling and Storage Area (SWMU 34) is excavation, off-post treatment/disposal, and land use restrictions. The total cost of this action is estimated at $63,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 34

The selected corrective measure for the Pesticide Handling and Storage Area is protective of human health and the environment, attains Federal and State requirements, and is cost effective. The selected corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. Land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 37

The selected corrective measures alternative for the Contaminated Waste Processing Plant (SWMU 37) is land use restrictions. The total cost of this management measure is estimated at $12,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 37

Because this corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 42

The selected corrective measures alternative for the Bomb Washout Building (SWMU 42) is soil cover, fence, and land use restrictions. The total cost of this action is estimated at $520,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 42

The selected corrective measure for the Bomb Washout Building is protective of human health and the environment, attains Federal and State requirements, and is cost effective. The selected corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. Land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 45

The selected corrective measures alternative for the Stormwater Discharge Area (SWMU 45) is land use restrictions. The total cost of this management measure is estimated at $12,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 45

Because this corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, land use restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 48

The selected corrective measures alternative for the Old Dispensary Discharge-Building 400 (SWMU 48) is land use restrictions. The total cost of this management measure is estimated at $12,000. The approval authority for this alternative is the Tooele Army Depot Installation Commander.

Gary B. Carney LTC, OD
Commanding
Tooele Army Depot

Date

DECLARATION STATEMENT FOR SWMU 48

Because this corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, land use restrictions will ensure continued adequate protection of human health and the environment.